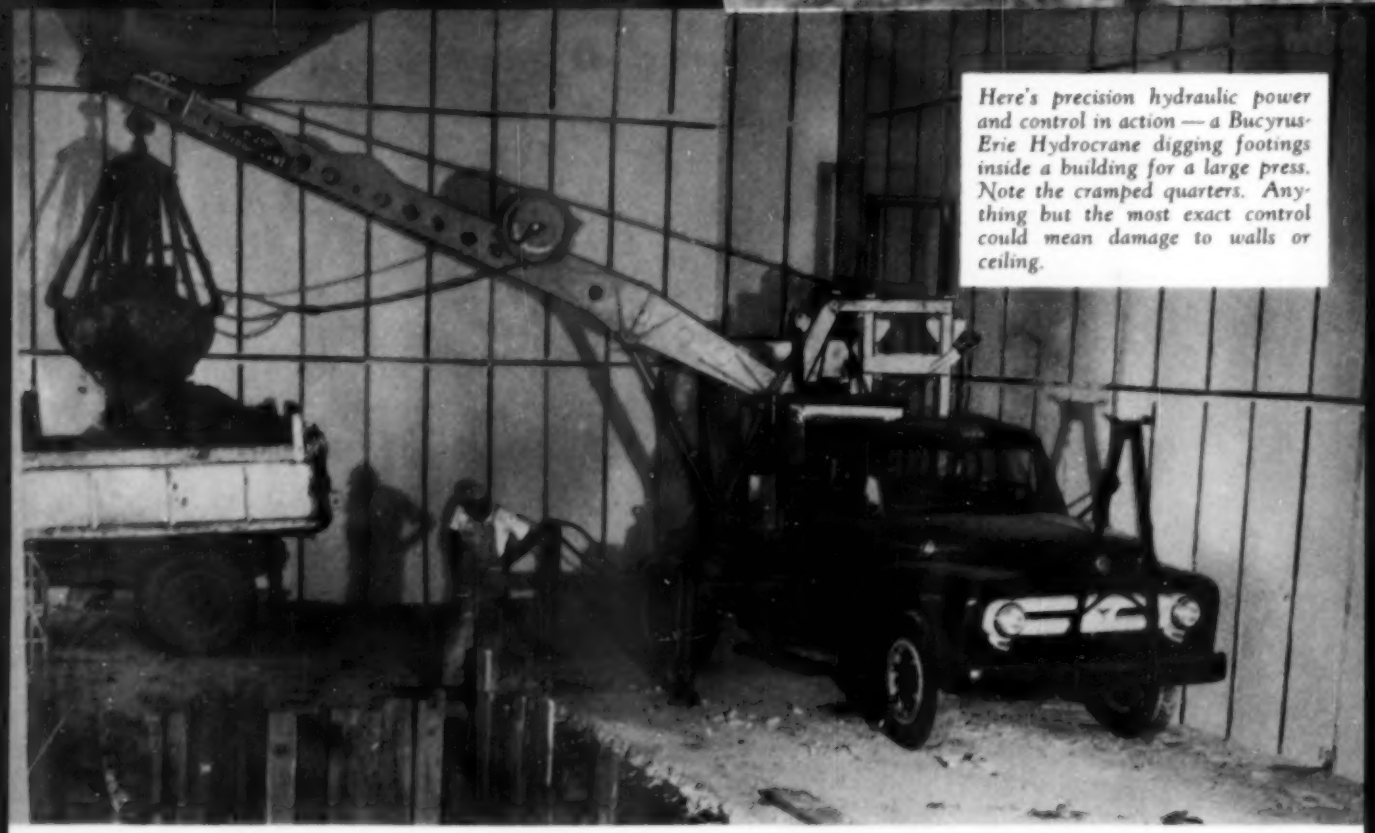
Excavating Engineer

founded 1905

FEBRUARY 1955

50th ANNIVERSARY 1905-1955 Excavating Engineer

Bulldozer spreads fill on South Dakota's rising Fort Randall Dam. It's a $200 million project featuring big dirt contracts. See page 16.



Here's precision hydraulic power and control in action — a Bucyrus-Erie Hydrocrane digging footings inside a building for a large press. Note the cramped quarters. Anything but the most exact control could mean damage to walls or ceiling.

Costly Jolts Gone—Fluid Action Hydrocrane Gives Cushion Lifts to Growing Range of Jobs

About seven years ago the revolutionary Bucyrus-Erie all-hydraulic Hydrocrane first demonstrated its almost unbelievable precision control. On one test it lifted, swung and set down a pyramid of six brimful drinking goblets, carried on a 1-ton steel test slab — without spilling a drop of water. Today greatly improved Hydrocranes and Hydrohoes with greater capacity and far faster line speeds are bringing this outstanding hydraulic precision to an ever increasing number of jobs.

Every crane or hoe function is fully hydraulic powered — swing, boom hoist, line hoist, boom telescope, outrigger control, clamshell bucket open and close.

You must *see* a Hydrocrane in action — digging foundations, spotting concrete buckets, erecting anything from steel beams to plate glass — to realize fully the advantages of fluid power and control. Arrange a demonstration now! Let us send you interesting new literature. Write today. 54H55C

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BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

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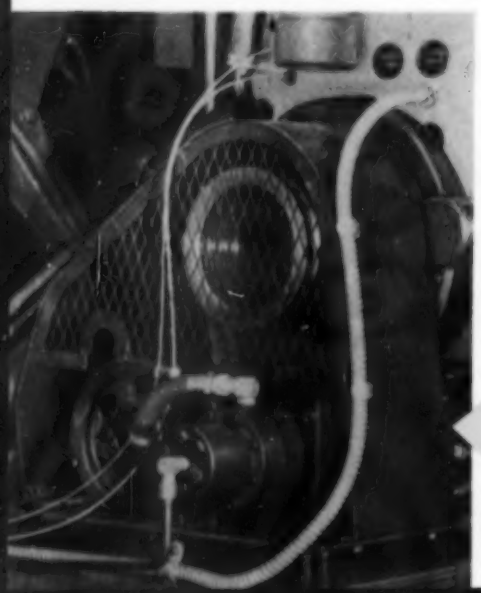
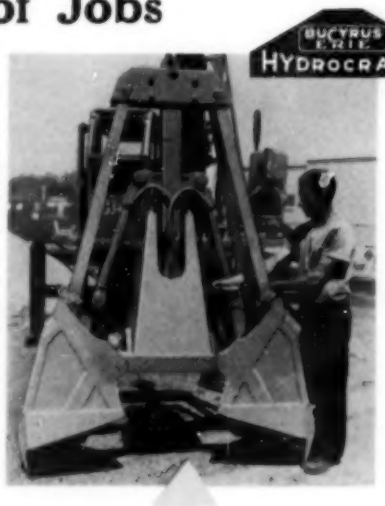


HERE'S SIMPLICITY THAT SAVES YOU MONEY

Hydraulic pumps driven by a compact engine, conveniently mounted on revolving frame, power the Hydrocrane. Hundreds of parts eliminated — no clutches, brakes, gears — no drums, chains, sprockets, or operating lever linkage.



NEW ⅜-YD. CLAMSHELL HAS 42 PERCENT MORE BITING FORCE

This new hydraulically operated clamshell is closed by means of hydraulically operated twin rams instead of a single-center ram. This feature plus improved design for greater leverage provides 42 percent more force on lips at point of closing. Bucket is equipped with quick disconnect coupling which can be attached or detached from bucket in a few seconds without tools — and without oil spillage.

1 Tractor handles dozing at 3 scattered plants

Stewart & Nuss Inc., producers of asphalt, sand, and aggregates under the trade-name Herndon Rock Products, use their high-speed, rubber-tired Tournatractor to handle dozing requirements of three plants scattered in a 6-mile area around Fresno, California.

At Plant #1, Tournatractor handles all dozing for crushing and screening output of 2,000 tons of aggregate daily. At Plant #2, where sand and gravel is secured from river bed, Tournatractor cleans all waste from 2,000 ton-per-day screening production. At Plant #3, where 1,200 tons of asphalt are made daily, it handles complete feeding of hopper. Unit also helps maintain all access and haul roads at the 3 plants.

200 tons hourly on 60 to 100' push

Company records covering typical feeding operation show Tournatractor pushes 3 cubic yards of crushed rock or sand per pass. Working 60 to 100' one-way, unit dozes at 3½ mph, backs up at 8 mph. Taking slightly over a minute for each cycle, it regularly delivers 47 loads per 50-minute hour . . . feeds hopper with 141 cubic yards or about 200 tons hourly.

Next to studying owner-verified performance figures like those above, perhaps the best way to judge equipment is to talk to the men on the job. Operator Lee Hunter says, "Tournatractor is the best muck moving rig in the business." And Foreman John Hart says, "In maintaining haul roads, Tournatractor easily does in 30 minutes what it ordinarily would take a crawler a half-day to do."

If your operation involves assignments where you can benefit from increased speed, it will pay you to investigate Tournatractor *before you buy another set of tracks.* Contact your nearest LeTourneau-Westinghouse Distributor for a demonstration on *your* job.

By dozing "in slot", Tournatractor carries loads of 3 yds. and more. Forward speed averages 3½ mph; return, 8 mph. On highway trips between plants, Tournatractor reaches 19 mph . . . usually averages 15 to 17 mph.

Operator's position ahead of engine gives him better visibility . . . keeps him out of flying dust and grit.

Recently, Westinghouse Air Brake Company purchased from R. G. LeTourneau, Inc. their earthmoving and related products together with their Peoria, Toccoa, and Australian factories. Adding the high quality standards, precision manufacturing experience, and research facilities of Westinghouse Air Brake to the earthmoving developments of LeTourneau, gives you assurance that the improved line of equipment offered by this strong new company is the finest on the market. Be sure to check LeTourneau-Westinghouse before you buy.

Tournatractor—Trademark T-514-Q-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

THIS Caterpillar HT4 Shovel feeds a 1500-lb. hot batch asphalt plant and loads trucks for Ideal Asphalt Paving Co., Inc., near Las Vegas, Nev. Plant production averages 500 tons per eight-hour day. This HT4 has loaded as much as 1300 tons of gravel in the same period of time!

The versatile CAT® HT4 Shovel can earn its keep at many tasks: bulk material handling, grading, excavating, light bulldozing, cleaning up. It's compact and maneuverable for work in tight places. Hydraulic controls are precise and fast-acting, and permit simultaneous raising and dumping of the 1¼-yd. bucket. Because it's designed as a unit, with the weight of the bucket evenly distributed along the full length of the tracks, it will not "dance," even with a full load.

Rugged construction is an important reason for the HT4's high work output. It's built to withstand extreme stresses and stay on the job year after year without costly down time. Carefully designed filters and seals protect the machine's Caterpillar-built precision. They keep oil and lubricants *in*, and harmful grit *out* of the engine and hydraulic system.

Ideal Asphalt is predominantly equipped with Caterpillar-built machines. They own two HT4 Shovels, a D7 and two big D8 Tractors, and three Caterpillar Diesel Engines. "We think we can make more money with the big yellow machines," says Mark C. Whiting, company treasurer. "They're dependable, and we can get parts and service when we need them. Our dealer service is the way we like it."

Your Caterpillar Dealer can give *you* the same kind of service. Ask him for black and white *proof* that the Caterpillar HT4 Shovel will do *more* work at *less* cost on *your* job than any other shovel of its size.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

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**NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE**

Advertisers

IN THIS ISSUE

Allis-Chalmers Mfg. Co. 6–7
American Manganese Steel Div., American Brake Shoe Co. 12
Aveling-Barford, Ltd. 9
Blaw-Knox Co. 57
Bucyrus-Erie Co. ..... Cover II, 37, 46–47, 58–59
Caterpillar Tractor Co. ..... 2, 52, 61, Cover III
Cooper-Bessemer Corp., The ..... Cover IV
Dart Truck Co. 13
Detroit Diesel Engine Div., General Motors Corp. 10–11
Drake-Williams-Mount 51
Eagle Iron Works 54
Euclid Div., General Motors Corp. 55
For Sale (Classified) 63–64
Franklin, M. N. & Co. 53
General Motors Corp., Detroit Diesel Engine Div. 10–11
General Motors Corp., Euclid Div. 55
Hayward Co., The 62
Hercules Powder Co. 4
Hough Co., The Frank G. 45
International Harvester Co. 32–33
LeTourneau-Westinghouse Co. 1, 14–15
Manitowoc Engineering Corp. 39
Marion-Osgood-General 40–41
M-R-S Manufacturing Co. 28–29
Northwest Engineering Co. 5
Owen Bucket Co., The 48
Phoenix Products Co. 51
Rogers Bros. Corp. 43
Sauerman Bros., Inc. 50
Sherman Products, Inc. 49
Westinghouse Air Brake Co. 56

Excavating Engineer

founded 1905

CONTENTS

Volume XLIX No. 2 **February, 1955**

Fort Randall Dam Enters Final Stages 16

$200 million project has flood control as its primary objective, features 28 million yd. earth fill, powerhouse, outlet works and spillway . . . is part of Missouri River Basin Project.

Long Beach Unscrambles Its Storm Drains—by Ray Day 24

Subsidence problems and low coastal area create design nightmare as postwar storm drain construction gains headway. Single rig digs and sets to solve space and water problems.

Rope Changing on Large Excavators—by N. Wilson, Mechanical Superintendent, The Electricity Trust of South Australia, Adelaide, S. A. 34

A few tools help cut down-time required to change large walking dragline's wire ropes. Here's the procedure followed in the coal mines of The Electricity Trust of South Australia.

Equipment You Ought to Know About 44

News from the Field 53

Dr. Eugen Diesel Visits U. S. 53
Ohio Pike Progress 53
Healy Uses Subway Forms 54
Safety Council Awards 54

New Trade Literature 56

Not in the Contract 60

Notes from the Manufacturers 62

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FOR A
RECORD BLAST—
explosives research pays off

A hill of hard, seamy granite 65 feet high, 100 feet wide, and 600 feet long, located between two sections of a new highway near South Billerica, Massachusetts, was broken to grade level on August 19, 1954, by the largest single blast ever made on a New England highway construction project.

The mound of granite was leveled by a controlled blast (small photo) of 26,400 pounds of Gelamite* dynamite primed with Hercules* Short-Period Delay Electric Blasting Caps. The excellent fragmentation is apparent in the broken rock pictured above.

Whether your blasting problems are routine or unusual, whether they involve construction, mining, quarrying, or other industrial applications—you can depend on Hercules' experience and knowledge in the manufacture and use of blasting materials to make your job easier.

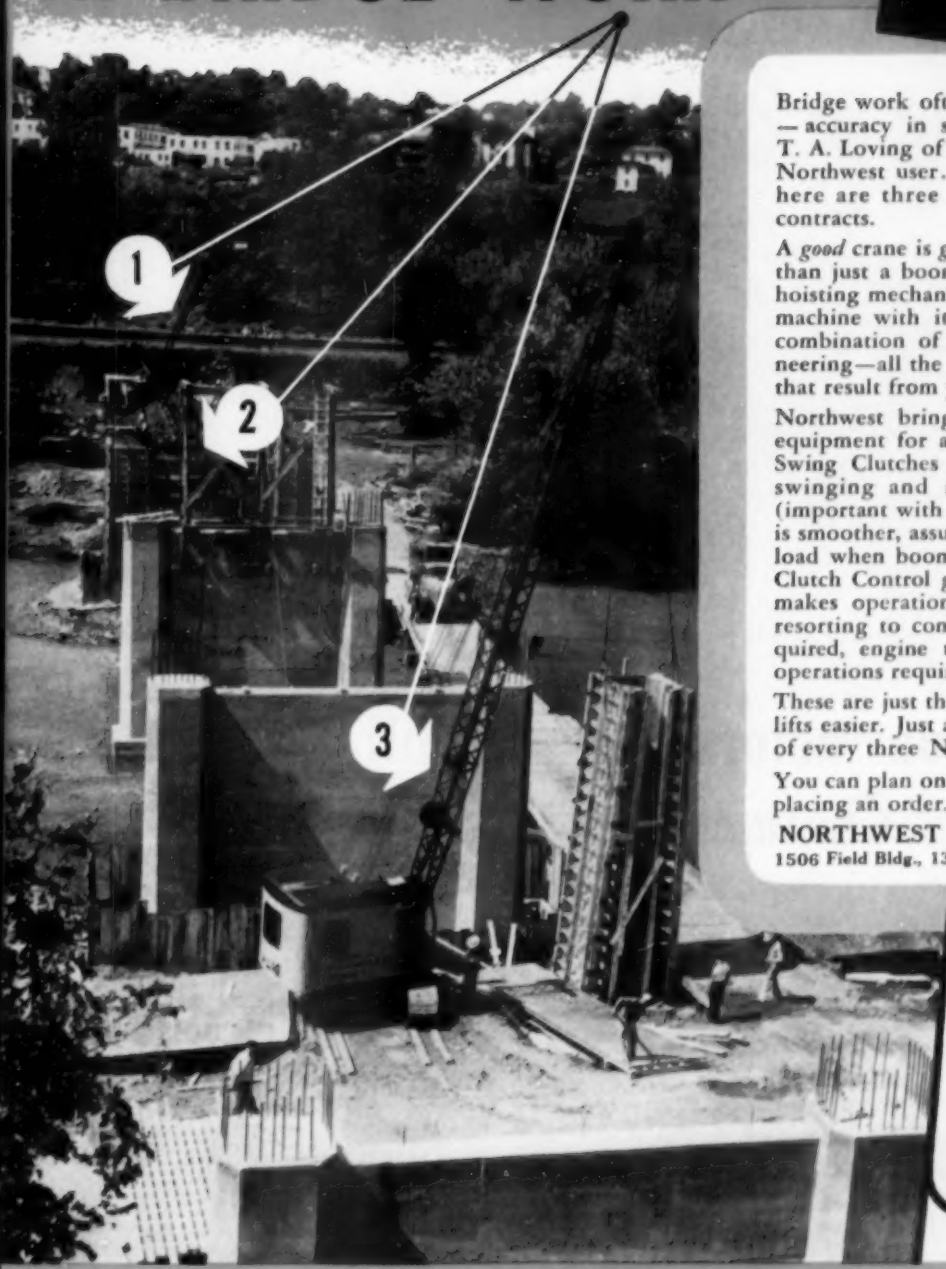
HERCULES POWDER COMPANY

Explosives Department, 972 King Street, Wilmington 99, Delaware

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Calif.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Calif.

CRANE VERSATILITY for BRIDGE WORK

SEVENTEEN NORTHWESTS for T. A. LOVING
Goldsboro, N.C.



Bridge work often calls for niceties in operation — accuracy in spotting, flexibility in booming. T. A. Loving of Goldsboro, N. C. is an old-time Northwest user. He has had 17 Northwests and here are three of them on one of his many contracts.

A *good* crane is *good* on every crane job! It's more than just a boom — or a feature — a clutch or a hoisting mechanism. It's a combination of a basic machine with its multiplicity of advantages — a combination of design, materials, balance, engineering—all the tangible and intangible qualities that result from years of experience.

Northwest brings you a choice of boom hoist equipment for any condition. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and makes spotting the load easy (important with high booms). Northwest steering is smoother, assures easier manuevering with the load when booming high. The "Feather-Touch" Clutch Control gives the "feel of the load" and makes operation smoother and easier without resorting to complicated mechanisms. When required, engine throttle control is available for operations requiring variable speed.

These are just the high spots for making the high lifts easier. Just a few of the reasons why one out of every three Northwests sold is a repeat order.

You can plan on a Northwest! Why not talk over placing an order. Get the full story.

NORTHWEST ENGINEERING COMPANY
1506 Field Bldg., 135 South La Salle St., Chicago 3, Illinois

If you need rubber tired equipment, Northwest Truck Cranes bring you a combination of advantages in Crane and Carrier not found in other similar equipment. Get the details before you buy.

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Preventive Maintenance Cuts Service Cost — Increases Earning Capacity

PREVENTIVE MAINTENANCE TRAINING KITS — movies, slides, charts and literature are available to help train your personnel. Your Allis-Chalmers dealer will present it for you at your convenience, or arrange to have a factory man do the job. And it can be tailored to suit your specific machines and job conditions.

How contractors can take full advantage of Allis-Chalmers Dealer Service Plan to help protect profits

BENEFITS:

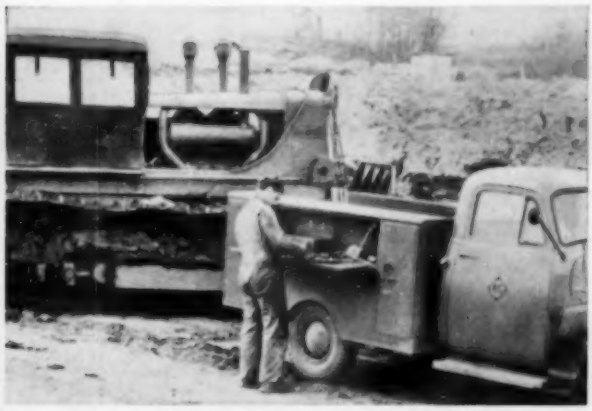
Better performance — more time on the job — longer equipment life — lower maintenance cost — higher resale value

Experience has convinced many contractors that the Allis-Chalmers Dealer Service Plan is geared to keep equipment operating efficiently. They have found that taking full advantage of such service is easy, and that it pays big dividends. Here's why.

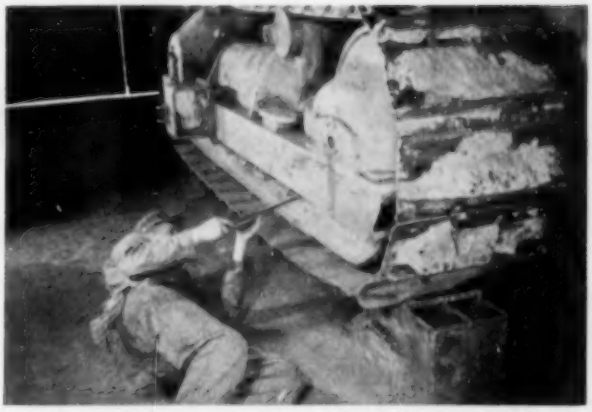
Allis-Chalmers dealers offer them a *planned* approach to service, right from the day their equipment is delivered. It covers everything from service schools to lubrication schedules, and from parts to preventive maintenance.

You owe it to yourself to take a look at the advantages this plan offers. Then see your nearby Allis-Chalmers dealer soon and ask him to give you all the facts.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.



FAST PARTS SERVICE — Factory-built Allis-Chalmers parts are stocked in quantities by the *dealer*, to give you parts service as close to your job as posible. And remember, experienced equipment men agree it pays to use only standard factory-built parts.

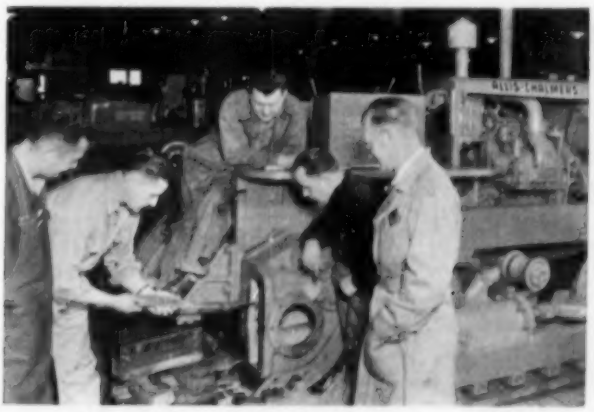


SCHEDULED CHECKUP PROGRAM — Your Allis-Chalmers dealer will help you plan a schedule for all maintenance to keep your equipment operating efficiently. You'll save on repair bills, avoid costly downtime, get far better performance, longer life from your machines.

OPERATING TIPS — Allis-Chalmers dealer servicemen are trained to give your operators all the facts they need to operate your equipment most productively. For example, one of the most important things for an operator to know — how to recognize when adjustments should be made.

SPECIALIZED FACILITIES at your Allis-Chalmers dealer include factory-approved tools and all necessary service equipment. Factory-approved methods are used to save you time and money, assure finest workmanship, to help you get full value for your equipment dollar.

FACTORY-TRAINED DEALER SERVICEMEN have the specialized experience to help you spot trouble symptoms fast, help you prevent costly breakdowns. Their training never stops; they make it a *policy* to stay abreast of every development so they can be of real value to you. And they're ready to go when and where they're needed.



FACTORY SERVICE SCHOOL TRAINING is open to your servicemen just as it is for dealers. Training is by men who know the equipment best. Visual aids and easily understood literature are used. And your men discover that Allis-Chalmers design simplicity makes the equipment easy to learn . . . easiest of all to service.

"Financial Security Is Based On Savings . . ."

ARTHUR B. HOMER
President
Bethlehem Steel Corporation

". . . and the purchase of U.S. Savings Bonds through the Payroll Savings Plan is one of the easiest ways for any individual to save for economic security."

If you agree with Mr. Homer that ". . . the Payroll Savings Plan is one of the easiest ways to save for economic security."—

If you believe with millions of other Americans that there is no safer investment than U.S. Savings Bonds—

Why not take a *really personal* interest in your employees and your Payroll Savings Plan?

Pick up the phone, now, and ask the man in charge of your Payroll Savings Plan three questions:

- **How many of your employees are enrolled in the Payroll Savings Plan?**
- **What is the percentage of employee participation?**
- **When did your company last conduct a person-to-person canvass?**

If less than 50% of your employees are enrolled in the Plan . . . if you have not conducted a person-to-person canvass in the past two years *(or if you do not have the Plan)*, act now! Telephone, wire or write to Savings Bonds Division, U.S. Treasury Department, Washington, D. C. You will hear promptly from your State Director, U.S. Treasury Department who will be glad to help you conduct a person-to-person canvass that will put an application blank in the hands of every employee. That is all you have to do. Your employees will do the rest. They want to save for their economic security.

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HEAVY-DUTY DUMPER

AVELING-BARFORD LIMITED GRANTHAM ENGLAND

803

Like these contractors, you can

Bid lower- Finish jobs faster- make more per contract

SPECIFY GENERAL MOTORS DIESEL POWER

In all your construction equipment

"Works faster... burns less fuel... costs less to maintain."

That's what these contractors—operating *seven* different kinds of General Motors Diesel-powered equipment—report about their GM Diesels. They've got on-the-job proof that a GM 2-cycle Diesel does more work at less cost on every construction job.

If your business is building anything from sewers to skyscrapers, you'll find a good way to build your business is to *specify* a GM Diesel when you buy equipment.

For this quick-acting 2-cycle Diesel accelerates faster under load, burns fewer gallons of low-cost fuel, stands up better even in toughest working conditions. You won't need service often but, when you do, your GM Diesel distributor backs up engine performance with fast service and quick delivery of low-cost parts, no matter where your contracts take you.

Today you can get GM Diesel power in over 750 different models of equipment built by more than 150 different manufacturers. Get their names from your local GM Diesel distributor or write direct for the list.

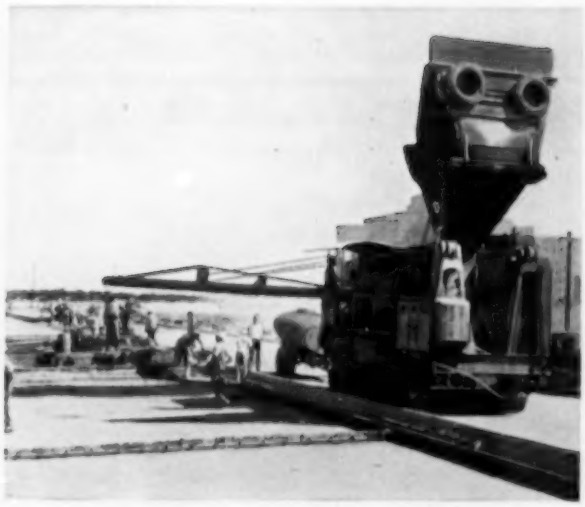
25% MORE WORK AT HALF THE FUEL COST

California contractors McGuire & Hester report they're getting 25% more work—and spending 50% less for fuel—since they converted this ¼-yard dragline from *gasoline to General Motors Diesel power*. The compact "4-71" GM Diesel did such a good job that the contractor repowered two more shovels with GM Diesel.

GM
GENERAL MOTORS
DIESEL POWER

WORKS ⅓ FASTER—CUT FUEL COSTS 60%

Maryland contractor Charles F. Knox, Jr., reports he gets ⅓ more production, has cut fuel costs 60%, since he converted this ¾-yard shovel from *gasoline to GM Diesel power*. The shovel works 8 to 10 hours a day, costs far less to maintain. You can specify GM Diesel power in over 50 shovel models built by more than 20 manufacturers.



PAVES 1400 FEET A DAY

This Koehring Paver, powered by a compact, quick-accelerating GM 2-cycle Diesel, lays 1400 feet of 25-foot wide pavement per day for the Austin Road Company of Dallas, Texas. You can lay pavement faster and at less cost with GM Diesel power—available as original equipment in 8 paver models made by 4 different manufacturers.

"FASTEST DITCHER IN THE AREA"

McGuire & Hester *specified* GM Diesel power in two new Buckeye Ditchers and a Lorain Crane, as well as repowering a Hough Payloader, after getting *more work at less cost* with GM Diesel power in their dragline. The master mechanic calls this GM Diesel-powered Buckeye Ditcher "fastest in the area."

NO REPAIRS IN TWO YEARS

These GM Diesel-powered LeTourneau-Westinghouse Tournapulls worked over two years in flying abrasive dust without losing a day for repairs, reports Arizona contractor Link L. Colvin. In every kind of earth-moving equipment GM Diesel power lasts longer, works faster, costs less to run and maintain.

DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines . . . 30 to 300 H.P. • Multiple Units . . . Up to 893 H.P.

LIGHT, RUGGED AMSCO® DIPPERS
deliver more loads per shift

The all-cast Amsco dipper is made of the toughest steel known . . . manganese steel. Amsco dippers withstand rough handling, sharp impact and grating abrasion because of this same sturdy construction. And all dipper segments are plug-welded together, adding strength without increasing weight.

Notice the raked design . . . those sharp, fanned teeth bite out a capacity load every time. Dumping is instantaneous, because the dipper bottom has a larger opening than its top. And there are no snagging edges or cavities on the interior to collect clods and lower loading capacity.

Specify these light, rugged, Amsco dippers to get more bite and higher loading into the working end of your dipper sticks. You'll get more digging done in less time at no increase in power load. Specify Amsco manganese steel, too, for other parts that must be *extra tough*.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

MODEL 20-S

20-ton end dump truck—120" wheelbase. Powered by 225 HP Diesel Engine with or without torque converter. 70,000 lb. Dart planetary rear axle with 20" x 9" air brakes—20,000 lb. front axle with 17¼" x 4" air brakes—14:00 x 24, 20-ply front tires—16:00 x 24, 24-ply rear tires. Hydraulic steering—13 cubic yard R/Q body. Approximate weight, 35,000 lbs.

MODEL 300/747—45-ton crane carrier—220" wheelbase. Powered by 200 to 250 HP Gasoline or Diesel Engine with 5-speed transmission and 2-speed auxiliary transmission. 25,000 lb. front axle with 20¼" x 5" air brakes—90,000 lb. tandem rear axles with 20¼" x 7" air brakes—(10) 14:00 x 24, 20-ply tires all around. Hydraulic steering. Approximate weight of chassis, 50,000 lbs. Other models available.

MODEL 15DT—Chassis for 7-7½ cubic yard mixer—138" wheelbase. Powered by 165 HP Gasoline Engine with 5-speed transmission and 3-speed auxiliary transmission. 22,000 lb. tandem front axles with 17¼" x 3" air brakes—28,000 lb. tandem rear axles with 16" x 5½" air brakes—(12) 10:00 x 22, 12-ply tires all around. Approximate weight of chassis, 14,000 lbs.

MODEL 55TA—55-ton end dump truck—211" wheelbase. Powered by two 300 HP Diesel Engines with torque converters. 200,000 lb. Dart planetary drive tandem rear axles with 20" x 9" air brakes—50,000 lb. front axle suspended with a hydraulic air strut with 20" x 9" air brakes. Steering by hydraulic power on a center bearing cushioned by captive air in hydraulic air strut. 18:00 x 25, 32-ply tires all around—30 cubic yard rock body. Approximate weight, 96,000 lbs.

MODEL 10-S—10-ton end dump—106" wheelbase. Powered by 156 HP Diesel Engine—14,000 lb. front axle with 17¼" x 3" air brakes—26,000 lb. full floating double reduction rear axle with 16½" x 7" air brakes—12:00 x 20, 16-ply tires all around. Hydraulic steering—6½ cubic yard R/Q body. Approximate weight, 20,000 lbs.

MODEL 30-SL—30-ton end dump truck. Full cab. 184" wheelbase. Powered by 300 to 350 HP Diesel Engine with or without torque converter. 100,000 lb. Dart planetary rear axle with 20" x 9" air brakes. 25,000 lb. front axle with 20¼" x 5" air brakes. 14:00 x 24, 28-ply front tires (16:00 x 25, 24-ply optional)—18:00 x 25, 32-ply rear tires. Hydraulic steering—20 cubic yard Rock body. Approximate weight, 44,000 lbs.

MODEL 35SA—35-ton end dump truck—169" wheelbase. Powered by 300 to 400 HP Diesel Engine with Torque converter. 100,000 lb. Dart planetary rear axle with 20" x 9" air brakes—50,000 lb. front axle suspended with a hydraulic air strut with 20" x 9" air brakes. Steering by hydraulic power on a center bearing cushioned by captive air in hydraulic air strut. 18:00 x 25, 32-ply tires all around—24 cubic yard Rock body. Approximate weight, 52,000 lbs.

MODEL 15S-BDT—15 cubic yard bottom dump truck—100" wheelbase (tractor). 70,000 lb. Dart trailer axle with 20" x 9" air brakes. Hydraulic or cable operated doors. Front tires, 13:00 x 24. Rear tractor and trailer tires, 24:00 x 25. Approximate weight of tractor-trailer, 40,000 lbs.

MODEL 200/456—25-ton crane carrier—184" wheelbase. Powered by 130 to 200 HP Gasoline or Diesel Engines with 5-speed transmission and 2-speed auxiliary transmission. 14,000 lb. front axle with (optional) 17¼" x 3" air brakes. 50,000 lb. tandem rear axles with 16½" x 7" air brakes. (10) 11:00 x 20, 12-ply tires all around. Hydraulic steering (optional) Approximate weight of chassis 26,500 lbs Other models available.

Advanced Engineering Makes DART Your Best Truck Buy

WHAT IS YOUR HAULAGE PROBLEM?

For over 52 years, DART has engineered and built trucks for heavy-duty, off-highway haulage. In the progression of years, many important improvements and a long series of DART "Firsts" have resulted. Exclusive features in DART TRUCKS may save time and money on your job. DART engineers may have the answer to your particular truck haulage problem.

The World's Largest Selection of Off-Highway Trucks . . .

10 TON TO 75 TON CAPACITY

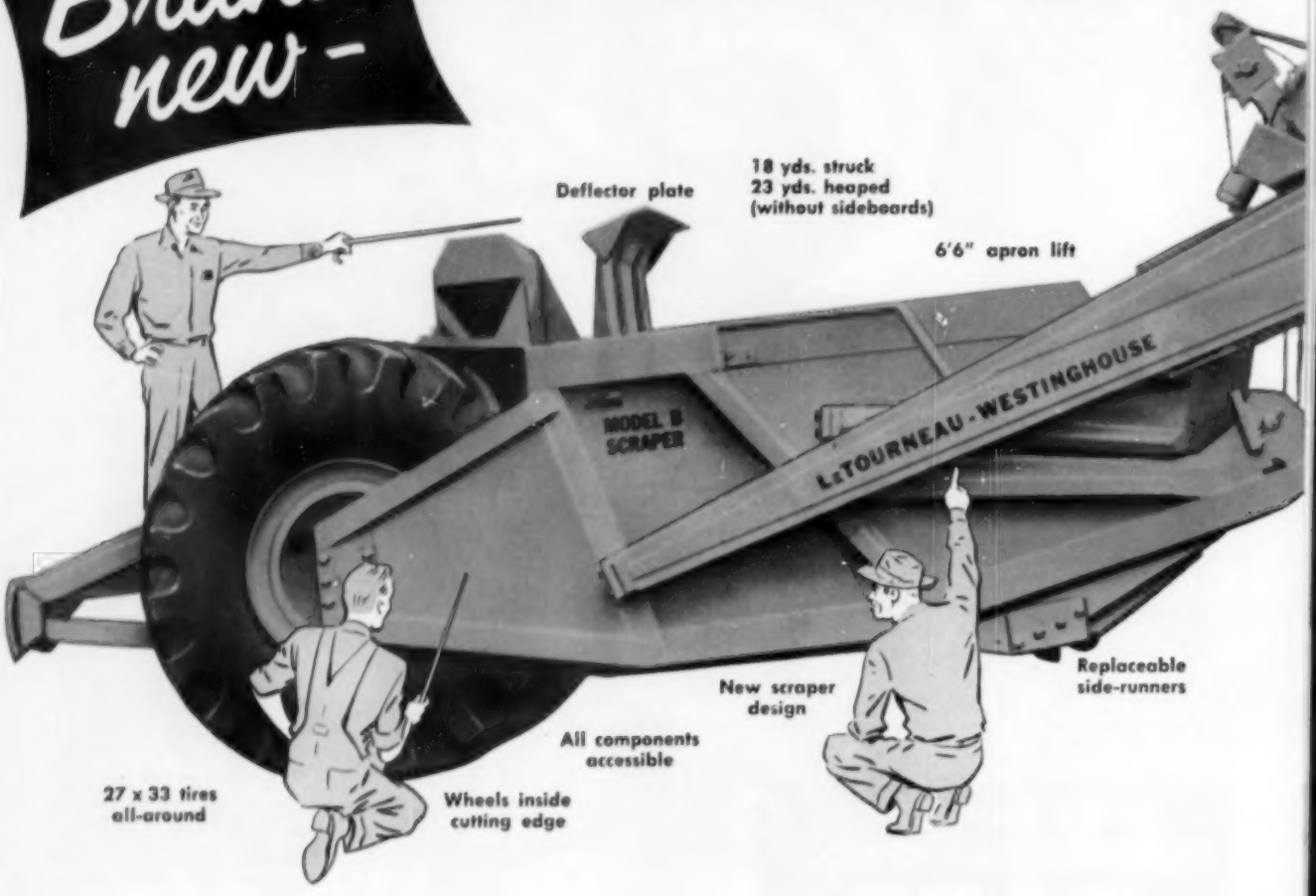
D101

DART TONNAGE ENGINEERED TRUCKS

Kansas City 8, Missouri

SUBSIDIARY OF THE CARLISLE CORPORATION

Brand new — from the ground up...the



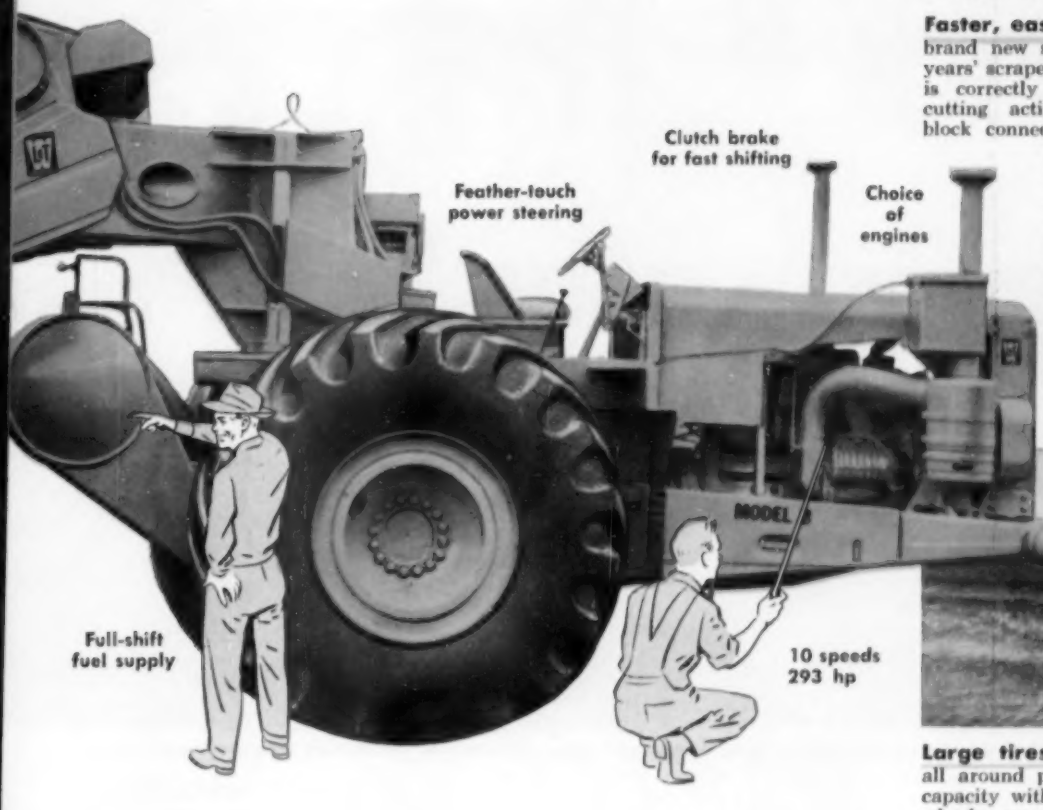
B TOURNAPULL is the first machine completely designed and built by the new LeTourneau-Westinghouse Company. Developed by our new engineering and research staff, it was built after careful study of today's scraper requirements. The *new* Model B prime-mover is a big, powerful tractor engineered for quick and easy replacement of component assemblies. All major assemblies — transmission, clutch, final drive, differential, etc. — can be lifted from the machine without necessity for time-consuming handling of other components. Every part of both prime-mover and scraper is engineered with a "plus" safety factor to give you the most rugged scraper unit ever built. Prototypes of the "B" were put through rugged tests on our new proving grounds. They were then tested on-the-job by leading contractors in all types of materials under rugged field conditions. The new LeTourneau-Westinghouse Company has carefully and thoroughly designed, tested and job-proved this new "B" Tournapull before putting it into production. Before you buy any scraper, be sure you check the BIG "B." It's available NOW.

Biggest single-engine self-propelled scraper on the market. "B" packs in 18 cu. yds., struck, or 23 cu. yds. heaped, *without sideboards.* New scraper design makes for easy loading. Proper weight distribution that puts 56% of loaded scraper weight on drive wheels, plus 293 hp of diesel power, help get heaped loads in a hurry. You have a choice of Cummins or GM engines for standardization with other equipment in your fleet.

LeT

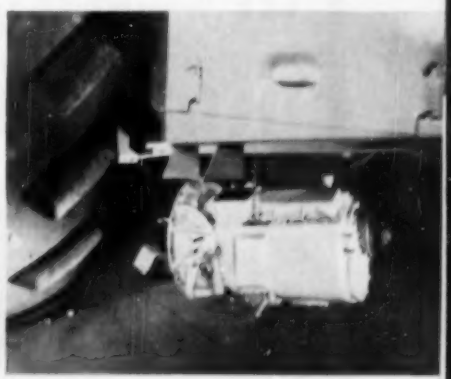
A Subsidiary of
Westinghouse
Air Brake Company

new 23-yd. B Tournapull



Faster, easier loading is a feature of brand new scraper design based on 36 years' scraper building experience. Blade is correctly angled for most efficient cutting action. Newly-designed push-block connects with scraper bottom as well as side sheets. This gives direct action to utilize full power of push-tractor for faster easier loading. Deflector plate at rear of bowl and curved apron provides easy boiling action. Scraper wheels track inside cutting edge. Apron lifts 6'6" to permit free ejection of any material. Cables are short. Welded box-beam construction increases strength, lowers deadweight.

Large tires (27.00 x 33, 30 ply) used all around provide ample load-carrying capacity without overloading. Tires and wheels are interchangeable between prime-mover and scraper. One spare serves your entire fleet.



Ten gear ratios allow you to select working speed best suited to underfoot conditions. Low gear matches pusher speed, enables "B" to help itself in loading . . . gives full lugging power for pulling through soft going. Clutch brake permits fast shifting without gear clashing. No double-clutching is necessary. This combination of 10 speeds, plus clutch brake for fast shifting, means hauling at higher speeds . . . more trips per hour.

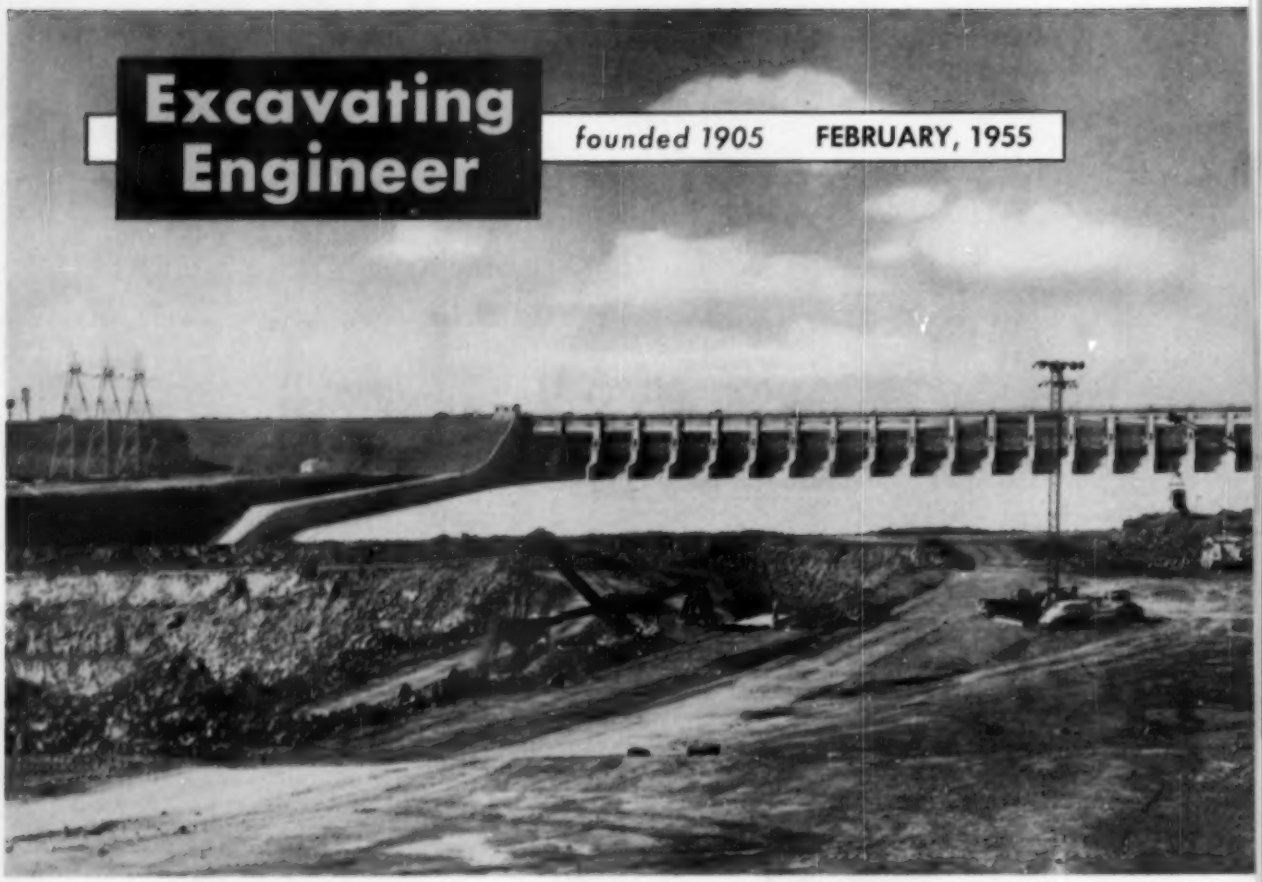
Instant-response, positive electric controls are simpler and trouble-free. New feather-touch power-steer gives you feel of the road. Tailgate and apron are controlled by a single control switch. Tailgate moves forward automatically as soon as apron reaches full raised position. All electric motors, including steering motor, are in the open for easy adjustment when necessary. Electric controls enable operators to do better work all day long.

Easy accessibility of all components facilitate quick servicing and repair. Disassembly is easy. For instance, you can drop transmission in less than an hour without pulling engine. Bolt sizes are held to a minimum. Quick disconnects are used wherever possible. Drain and fill plugs are easily accessible. Number of lube points and types of lubricants are reduced to lowest practical limits. Large fuel tank with ten-hour supply is provided.

Tournapull—Trademark Reg. U. S. Pat. Off. BP-777-G

LeTourneau-Westinghouse Company, PEORIA, ILLINOIS

Excavating Engineer
founded 1905 FEBRUARY, 1955



General view of List & Clark Co., Kansas City, Mo., spread, downstream below spillway; four excavators form leading-out team.

Fort Randall Dam Enters Final Stages

$200 million project has flood control as its primary objective, features 28 million yd. earth fill, powerhouse, outlet works and spillway . . . is part of Missouri River Basin Project.

IN SOUTHEASTERN South Dakota at a point just six miles from beautiful Lake Andes, 28 million cubic yards of earth fill and 25 million yards of chalk berm stretching almost two miles across the Missouri River form the fourth largest earth-fill dam in the world: Fort Randall Dam.

The rolled earth structure is 160 feet high, 4,500 feet wide at the base and it tapers to 60 feet at the top. It impounds 6.3 million acre-feet of water—making it the sixth largest reservoir in the world. The reservoir, impounding the run-off from a 263,480 square mile area, covers 118,000 acres in a lake 2 miles wide and 150 miles long. These impressive totals, as might be expected, give a good indication of the project's primary purpose: flood control. Other objectives include providing hydro-electric power, storage for irrigation, improved water courses on the Missouri and Mississippi Rivers for navigational purposes, and facilities for recreation and wildlife preservation and propagation. Here in one of the finest pheasant hunting grounds in the country, the last mentioned is certainly not the least important.

Ground breaking ceremonies for the $200 million project occurred in August of 1946, with a tentative completion date set ten years later. As of this year (1954) practically all of the main components—rolled earth fill, intake and outlet works, power house and spillway—have been completed or are very nearly so. Only the installation of additional generators and turbines with the necessary equipment required to operate them and the taking out of the downstream plug in the spillway remain on the agenda.

Fort Randall Dam and reservoir is another link in a chain of such projects along the Missouri, an addition to the integrated, comprehensive plan to contain and control Big Muddy. It wasn't very long ago that the Missouri River flooded its entire richly developed lower valley on an annual basis. As a matter of fact, there are two flood danger periods each year; one during early spring when

Water rushes out of four direct release tunnels, reaching velocity of 50 mph., emptying into a stilling basin to dissipate its tremendous energy before continuing trip.

the melting snows of the lowland prairies combine with ice jams in the river, the other early in summer when snow on the eastern slopes of the Rocky Mountains melts and joins with the then seasonal showers. As recently as 1951, flood losses in Kansas totaled $12.5 million and took 41 lives. No wonder, then, that The Missouri River Basin Project was authorized way back in 1944, when the 78th Congress passed the Flood Control Act. The project ultimately will be composed of a system of 105 reservoirs, built under two principal agencies, the Bureau of Reclamation and the Corps of Engineers.

Fort Randall Dam will work with others already in operation, under construction, and authorized for construction: Garrison, N. D., Oahe, Big Bend and Gavins Point, S. D., plus Fort Peck in Montana. They will bring economic benefits to people living in and around the Missouri River Valley. Fort Randall's importance stems from its strategic location on the Missouri. It is well downstream and controls a large drainage area from which floods can originate. Moreover, it is close to existing power markets so that its hydroelectric functions will be important.

Its four principal features include the 10,000-ft. long earth fill embankment, the 320,000 kilowatt capacity power installation, the outlet works for which 1,240,000 cubic yards of concrete were needed, and the 620,000 cubic foot capacity spillway. The project is being constructed by the Corps of Engineers under the general direction of the Division Engineer, Missouri River Division, and the immediate supervision of the District Engineer, Omaha District.

The dam will carry US 18 and 281

Dean Peters, project superintendent on the List & Clark Co. contract, stands alongside one of five Allis-Chalmers HD-20 tractors used to spread earth fill on dam proper.

Looking down from spillway reveals part of chute and stilling basin which form concrete floor running close to 40 acres in area.

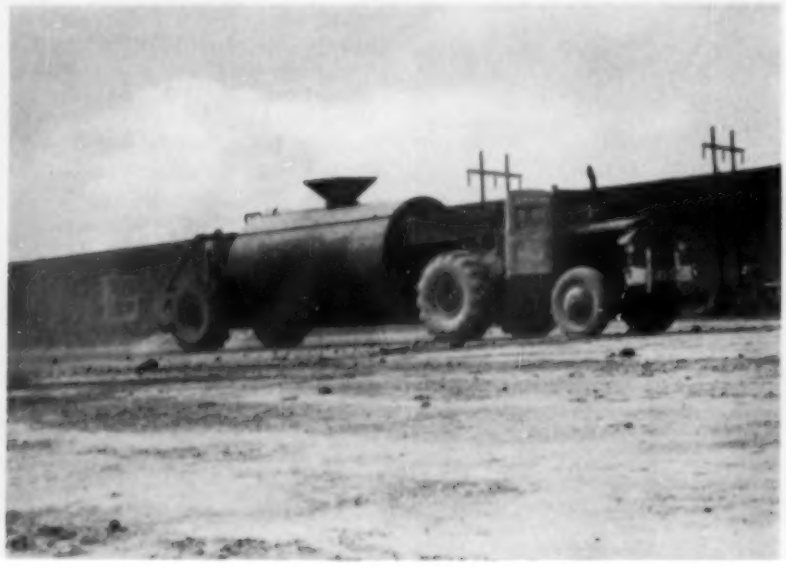
across its crest, both having been relocated from their original crossing at Wheeler, 15 miles upstream from the dam site. The bridge at Wheeler was taken farther upstream to Chamberlain, where it was joined with the existing span at that point to form a 4-lane crossing. A railroad crossing at Chamberlain was also moved one mile upstream and raised to accommodate the expanding reservoir.

The Corps of Engineers built a town at the site to precede dam construction. Called Pickstown (pop. 2217), it was named after Army Chief of Engineers Maj. Gen. Lewis A. Pick who has been influential in the entire Missouri River Basin Project. It has about what any small community might have: church, school, hotel, restaurant, and the Army Engineers' administration building, where Area Engineer G. O. Evans and his staff make their headquarters. The staff includes C. R. Brown, assistant area engineer in charge of construction; R. H. Fero, office engineer; J. C. Patterson, resident engineer, outlet works; E. E. Wohlford, resident engineer, Spillway; C. A. Hollis, resident engineer, embankment, and L. W. McCloy, resident engineer relocation.

After construction of the dam is completed, most of the town will be vacated, although some of the barrack-type dwellings will be renovated to house maintenance personnel.

The name, "Fort Randall," commemorates a military post, now defunct but with the chapel ruins and officers' quarters buildings still in evidence, established in 1856. It was named after Col. Daniel Randall, who was a paymaster at the old fort at that time. The fort was abolished in 1892.

Keeping dust down on haul roads, one of company's two 5,600 gallon capacity water wagons is active; Euclid tractor and tank is powered by General Motors 6-110 Diesel.



Pressure Relief Wells

The dam rests on the river bottom—a pervious stratum of valley sands and silts which permit some movement of water beneath the barrier. The rolled embankment placed on top is composed of selected impervious soils to hold back the water. To prevent seepage under the base of the dam, an additional impervious 10-ft. thick blanket extends 1,600 feet upstream from the base, with another upstream (chalk) blanket tapering 10 to 25-ft. upward on top of that layer. The chalk blanket serves a dual purpose: (1) to stabilize the upstream slope embankments, and (2) in lieu of riprap, serves to protect the upstream slope from wave action. Behind the spillway and near the intake, 83,000 cubic yards of riprap were dumped. Contractors were required to take all rock over 12-in. diameter out of the material they excavated and save it for this purpose.

Similar in composition, the downstream chalk blanket runs about 2,000

feet from the base, acts as ballast, and prevents slides on that side. Here, also, are a series of pressure relief wells located at the toe of the earth fill which serve to relieve any excess water pressure that may develop beneath the downstream chalk berm.

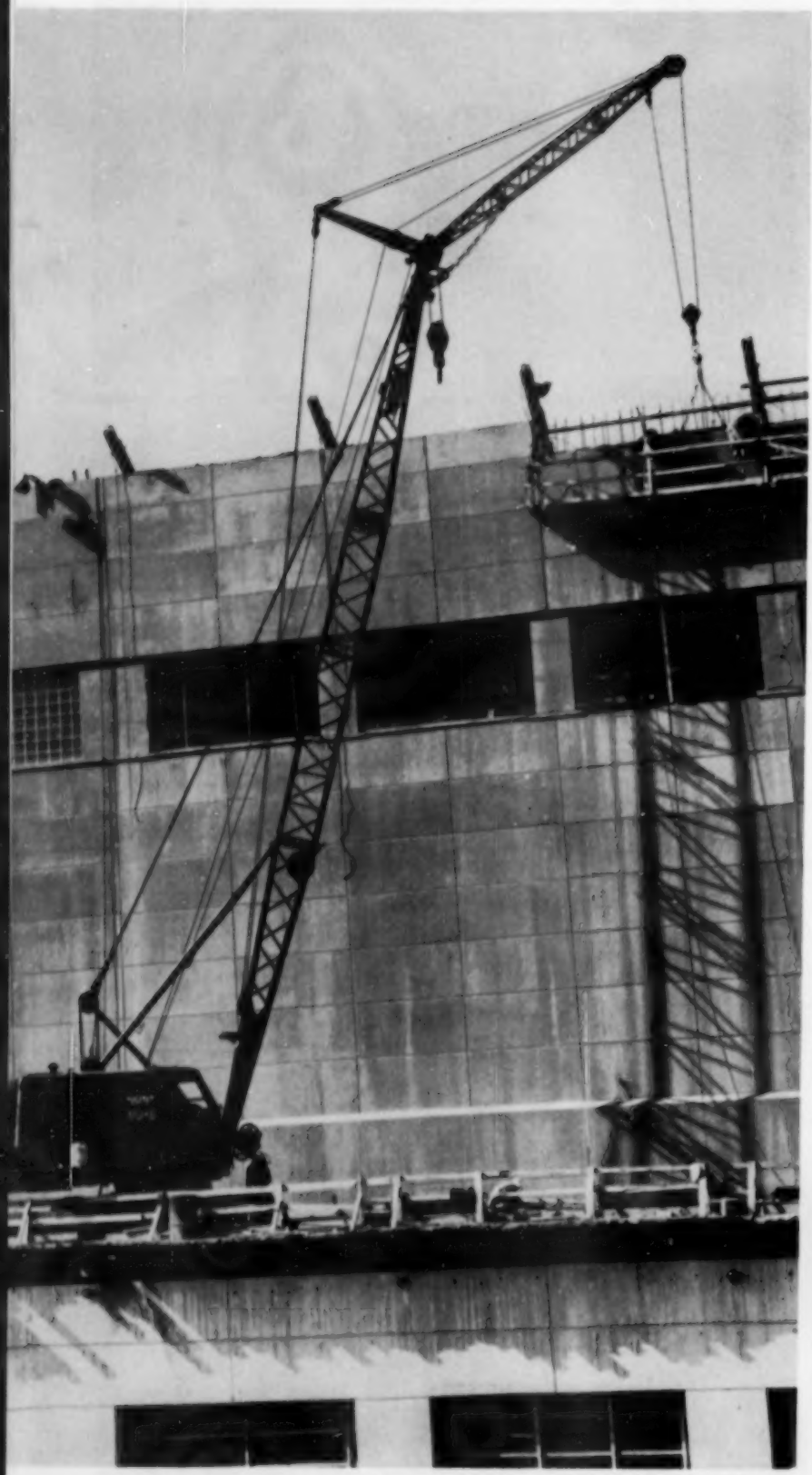
Approximately 28 million cubic yards of rolled earth and 25 million cubic yards of chalk berm from structure excavation went into the earthen barrier. Exacting technical standards in regard to moisture content and compaction were employed.

Work started in 1946, with all contracts having been awarded on a competitive bidding basis. Peter Kiewit & Sons Co. of Omaha, Neb., won the initial ($234,100) portion. It included clearing and foundation preparation of the left bank chute. In addition to ground preparation including the placing of 500,000 cubic yards of fill on the dam proper, the Kiewit project served to give engineers an idea of the formations to be encountered for use in forthcoming contracts.

One of two power units supplying the Bucyrus-Erie 150-B electric shovel; mounted on tandem-axle trailer, it consists of Caterpillar Diesel and General Electric generator.

Of the 28 million yards of rolled earth, Western Contracting Corp. of Sioux City, Iowa, placed by far the largest portion, having handled the second, third and fourth of five stages of earthmoving. Contract value ran $21,-

Bucyrus-Erie 150-B electric shovel loads bottom-dump Euclid. Background light tower is powered by Cat D311 motor-generator.



Donovan-Lovering-Boyle combine has powerhouse contract. Using a Bucyrus-Erie 38-B crane, slab facing is hoisted to top of building in final stages of construction.

136,400 and involved 24 million cubic yards of excavation. They placed 22.5 million cubic yards of the material which make up the dam, moved an average of 60,000 cubic yards (including placing) per day, and hit a peak of 80,000 one day. Dozers and road graders were used to spread the fill in thin lifts for the sheepsfoot rollers in compaction operations. Whenever needed, water was added by mobile water tanks, churned by disk harrows, to obtain the necessary compaction.

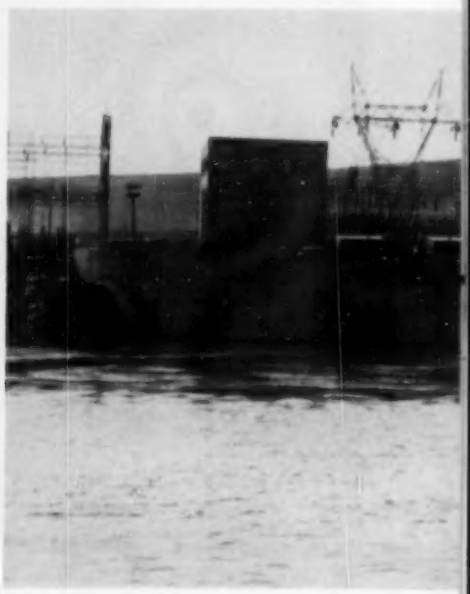
Western's excavators for loading out the fill were headed by two 191-M Marions, with 11-yd. dippers and a 151-M dragline with an 8½-yd. bucket. Euclid bottom and end dump haul units made up the moving team.

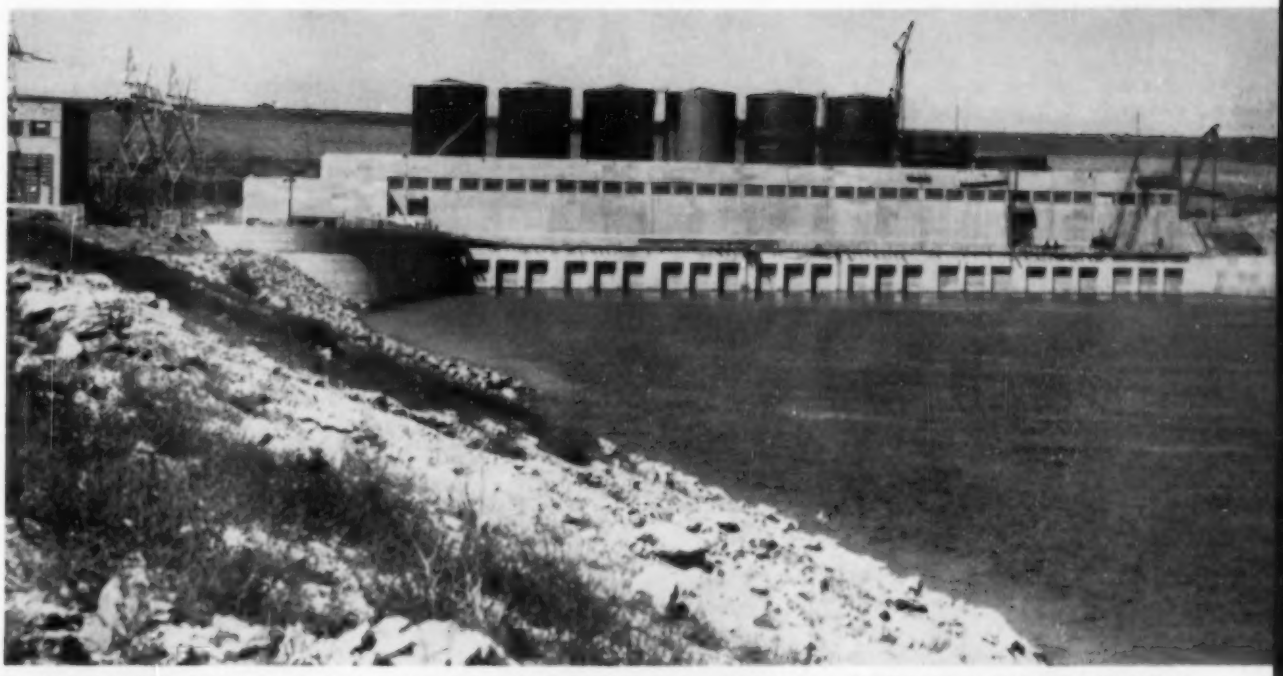
Diversion Procedure

Stream diversion was done in the summer of 1952 in a 5-day operation, through the then completed outlet works using a portable hydraulic dredge of Western's own manufacture, which choked off the main stream by placing the chalk fill in the river. The river was then channeled through the outlet works tunnels.

The fifth contract involving dirt moving was awarded to the List and Clark Construction Co. of Kansas City. Nine and one-half million cubic yards of excavation with a contract value running approximately $5,214,000 are included in this, the last stage of construction.

The powerhouse is located on the left bank of the river constructed at the toe or downstream side of the dam. Rising 150 feet (50 feet of which ex-





Surge tanks, rising behind power house, connect to tunnels, act as shock absorbers, are 100 feet high, 60 feet in diameter.

tend below ground level), it is 710 feet long, 100 feet wide, contains 273,000 cubic yards of concrete. Eight generators will eventually be placed inside, each capable of producing 40,000 kilowatts. Westinghouse of Pittsburgh, Pa., has the $8.2 million contract for their construction and installation, in conjunction with Allis-Chalmers Mfg. Co. of West Allis, Wis., which has the $5.5 million contract for the eight turbines.

Twelve 22-ft. diameter steel penstocks made by the Pittsburgh-Des Moines Steel Co. of Des Moines, Ia., (contract value: $8,385,000, including surge tanks) are channeled through the power house. Eight of the tunnels, 900-ft. long, are directed to the turbines; the remaining four connect with direct release tunnels which empty into a stilling basin, where the water pouring out of the tunnels is dissipated of its energy before returning to the river. To accomplish this task, the floor of the stilling basin is constructed so that it is 30 feet higher downstream than at the direct release tunnels' exits. Water reaches a velocity of 50 mph at these exits, for instance, but this speed is substantially reduced by the time it leaves the basin and empties into the river.

Tanks Take Shock

Behind the powerhouse eight 60-ft. diameter surge tanks rise 100 feet from

Below left: Electric power is fed through underground system to this switchyard. Below right: Intake structures on reservoir side.

the tunnels to which they are connected. Their purpose is to absorb shocks resulting from any sudden starting or stopping of water flowing to the turbines.

The $12,955,000 powerhouse contract was handled by a combine, Donovan-Lovering-Boyle. The stilling basin construction (contract value: $11,435,700 including sub-station) went to McCarthy Improvement Co. of Davenport, Ia. The 12 tunnels (contract value: $8,-585,880) were built by Silas Mason Co. of Shreveport, La. The intake structure (contract value: $11,911,800 including stage one of the spillway) went to Johnston-Winston Co. of Minneapolis, Minn.

Work on the powerhouse itself was very near completion when *Excavating Engineer* visited the scene. The D-V-B joint venture consists of Donovan Bros., Minneapolis; Lovering Construction Co., St. Paul; and Boyle Construction Co., Chicago, Ill. At the time of our visit, this outfit was using a Caterpillar Diesel powered Bucyrus-Erie 38-B crane to set precast concrete slabs used as facing for the building.

The powerhouse also houses an erection bay to handle the huge generators and turbines, a service bay, office space, and a control room. The nerve center of the dam is the control room. Here, operating features of the entire project are not only governed, but recorded on perpetually revolving and rotating graphs, providing a permanent record of operations.

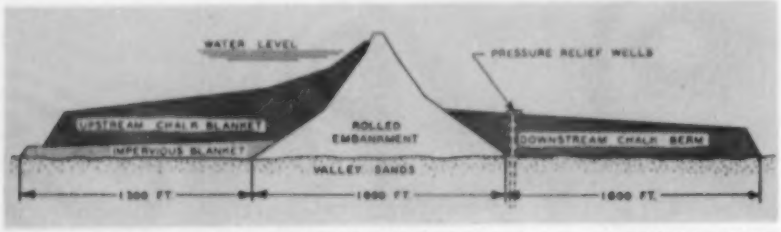
The first generating unit was started officially by President Dwight D. Eisenhower in March 1954; the eighth and last is scheduled for installation in 1956.

Power, in the form of electrical energy, is fed to an adjacent 900x250-ft. yard through underground conduits, and from here is channeled to various local systems via 115,000 and 230,000 volt lines. When operating at full efficiency, 320,000 kilowatts of electricity will be available . . . approximately four times the electrical energy needed for the entire city of Omaha, Nebr.

Out in the reservoir directly behind the power house is the intake structure, or at least the visible portion thereof, which is linked to the dam proper by a service bridge. Each of the 12 tunnels has two water passages at the intake end, each equipped with 50 ton steel gates to control the flow to the turbines and stilling basin, which are joined together to provide one continuous operating deck complete with gantry crane for emergency use. Trash racks, across the front of the tunnels, prevent large logs and other foreign matter from entering.

Some 195,000 cubic yards of concrete were poured for the intake structure by the Johnston-Winston combine, and the Silas Mason Co. put an additional 122,000 cubic yards into the tunnels.

Underground blasting is handled by Joy rotary drill mounted on Ford tandem-axle truck. Casing used in loading operations is manipulated by Northwest crawler crane.



Cross-section of dam. It is 160 feet high, 60 feet wide at top, and 10,000 feet long.

Spillway Design

An approach channel which was cut through solid rock is directed to the massive spillway . . . a 1,457-ft. long structure for which 390,000 cubic yards of concrete were needed. The structure is designed to pass the largest possible flood which may occur. To control the flow of water, the spillway consists largely of 21 steel tainter gates 40 feet long and 29 feet high separated by twenty-eight 10-ft. wide concrete piers which are individually controlled by electric hoists to raise or lower a unit in 1-ft. advances. The structure also boasts a complete built-in de-icing system so that operations can be carried on even during a cold Dakota winter.

Whenever a gate has to be repainted or otherwise repaired, a monorail carrier system is available to plug the gap with a stop log.

Passing over the crest downstream from the gated structure, water will flow into the chute and stilling basin before returning to the river proper. These two components form a concrete floor running close to 40 acres in area, with 15-ft. high walls on either side, and all of the concrete is reinforced.

Al Johnston Construction Co., Peter Kiewit, Western and Condon-Cunningham joint ventured on the spillway, stage II, contract (value: $8,364,000).

List and Clark's portion of the whole, not at all the biggest contract in either dollar worth or volume of excavation, but an important and interesting operation was in full swing when *Excavating Engineer* visited the scene. It consists largely of taking out the downstream portion of the spillway, although the company did have five million cubic yards of earth fill to put into the dam proper. The firm's contract amounts, broken down, run approximately 4.5 million cubic yards of chalk berm, 4 million of over burden, and a million of borrow—from two pits, all of which went into the rolled earth fill.

Almost all of the material presently being moved from the downstream section is chalk. But then, most of the chalk in this part of the country can be found right here, where the Niobrara geological formation is located. Niobrara is a dirty gray material, packs about as solid as concrete. All of it had to be blasted before moving in with power shovels. Indeed, the haul roads cut through Niobrara resembled a well paved highway . . . when dry. Rains made them impassable, not so much like a muddy backroad as like a well greased board, so that work came to a comp'ete halt when a shower of any intensity came down.

Build Haul Roads First

List and Clark moved onto the site on Aug. 30, 1953, started constructing haul roads immediately. With a couple of Caterpillar D8's and scrapers, plus the helping hand of a Bucyrus-Erie 150-B with a 7-cu. yd. dipper, accesses were completed in short order. After completing the haul roads and ramps, the contractor moved 1.3 million yards of unclassified material from the spillway excavation with a Euclid loader, a Bucyrus-Erie 150-B shovel and a Northwest 85-D dragline before starting chalk excavation on Dec. 8, 1954.

The blasting crew took over, armed with a Joy rotary mounted on the back of a 2-ton Ford truck, with Gardner-Denver compressor powered by a Caterpillar D4600 engine. Most all of the footage was set down using a 4-in. bit, with spacing 12x12 to 16x14. More than 200 holes were put down, on the average, per 10-hour shift, and the average depth ran 11 to 14 feet, so a day's work produced well over 2,000 feet.

Manitowoc dragline, powered by GMC 671 twins, loads into bottom-dump Euclids. Job is List & Clark Company operation involving excavation of plug below spillway.

DuPont F-1 blasting material was used on the chalk, where six holes were shot at a crack. With each stick weighing a little better than eight pounds, and from two to five sticks going into a single hole, three yards of chalk were brought down per pound of explosive. To load out the blasted material, List and Clark had two Northwest 80D's, a Manitowoc dragline, and the Bucyrus-Erie 150-B shovel.

Swinging an 8-yd. Hendrix dragline bucket, the Manitowoc was powered by twin GMC 671's and loaded out practically all of the looser, top bench material. Two Caterpillar-powered General Electric portable power plants supplied the 150-B with electrical energy, no adequate local source being available.

A 54-in. Euclid loader, a Bucyrus-Erie 150-B shovel and a Northwest 80-D dragline handled 1.5 million cubic yards of earth from the spillway excava-

Continued on page 42

One of two Northwest 80-D shovels working on List & Clark operation. Both excavators are powered by Murphy Model 21 engines. Note excellent condition of roads.

Long Beach Unscrambles Its Storm Drains

by Ray Day

Subsidence problems and low coastal area create design nightmare as postwar storm drain construction gains headway. Single rig digs and sets to solve space and water problems.

BETWEEN American Ave. and Atlantic Blvd. in Long Beach, Calif., excavating equipment belonging to V. C. K. Construction Co. and Bebek Construction Co. is busy among the oil derricks of Signal Hill with construction of a new storm drain. In other parts of Long Beach, similar work is either completed or just starting. In still other sections of the city, survey parties from Long Beach's Department of Engineering are staking out new work. At a recent job letting, the 12-foot diameter Northeast Storm Drain, whose preliminary plans took 52 sheets to detail, was awarded.

The extensive storm drain represented by these examples makes the city of Long Beach one of the most unusual in the nation as far as its solution of a universal problem is concerned. Prior to World War II, there were only two minor storm drain systems and pumping stations in Long Beach. Since the war, however, the city has constructed seven major pump stations, ranging from 150 to 550 cubic feet per second capacity, and has done considerable other work to develop the necessary storm drains around these pump stations.

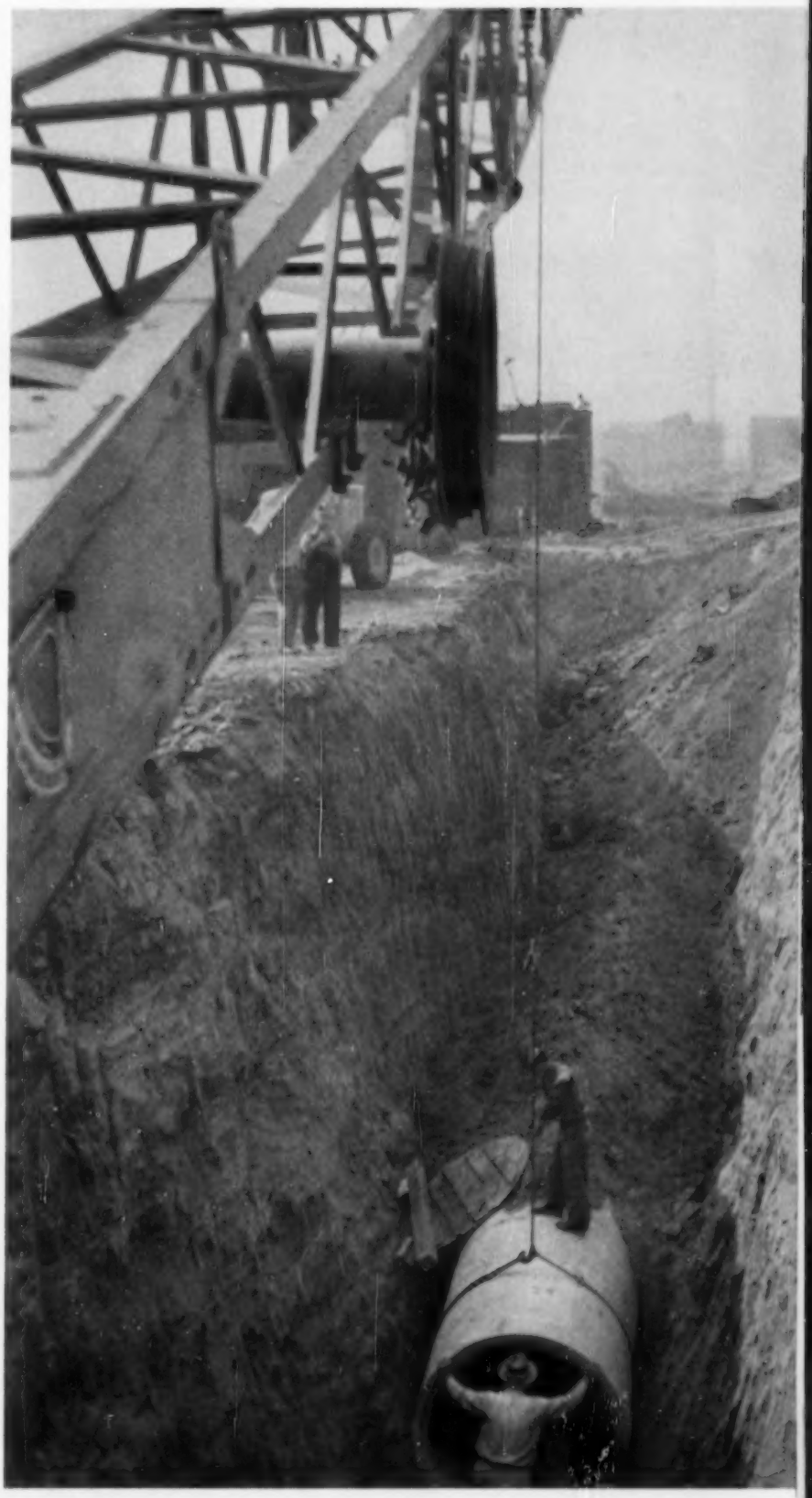
Most of this work has been done by

Top left: Bucyrus-Erie 38-B dragline encounters tough going digging around old concrete slab. Top right: Congested work . . .

Long Beach with its own funds. Only recently has the city participated in the worthwhile flood control program of the Los Angeles County Flood Control District.

What makes Long Beach's storm drain accomplishment so much a source of envy to city engineers and other city managers everywhere is the surmounting of enormous handicaps as the construction program proceeded. There are subsidence areas, particularly in the vicinity of Terminal Island, which have gone down as much as 17 feet since 1935. Subsidence has affected the flow in many a pipeline so that its direction has been reversed over the years. One of the newer storm drains now being designed lies practically along the ocean front and requires a pump station because of the subsidence problem.

However, even before subsidence became a problem, the natural Long Beach



. . . site left little room for dragline excavating trench for storm drain. Final picture shows 38-B placing 54-in. drain pipe.

Here's what subsidence in Long Beach did: two-story U.S. Coast Guard station sits visibly below levee at harbor front.

coastal area made that city a No. 1 candidate for storm sewer construction. Many of the residential areas in the city lie adjacent to the Los Angeles River, which bisects the town. Ground level in these residential areas is somewhat like Cairo, Ill., in relation to the Mississippi River: the houses are lower than the river level at high water. Since portions of the improved Los Angeles River Channel have subsided, along with the residential areas, the result is a harum scarum tangle, which design engineers have torn their hair over trying to solve. It has been impossible to design a system without the use of more pumping stations than average, so that water can be raised and discharged after its collection above the normal high-water mark of the Los Angeles River.

At the present time, the Army Corps of Engineers is redesigning and beefing up the levees near the mouth of the Los Angeles River to compensate in some measure for subsidence of the past and predicted subsidence of the future. The best estimates say that maximum ultimate subsidence of about 30 feet can be expected in the center of the 1½-mile-diameter saucer oriented around Terminal Island. Thus design engineers planning Long Beach's storm drain system have never been able to forget that tall apartment buildings near the mouth of Los Angeles River are lower than the restraining river levees and will settle still more.

International TD-14 dozer cuts out work road for P&H 655-B clamshell-equipped crane.

It is this situation which the storm drain program is designed to whip. It's the background situation which has caused Long Beach's design engineers considerable worry and has aroused the interest of engineers, all over the nation, sympathetic with the general problem.

Long-Range Program

The combination V. C. K.—Bebek drain project corrects a strictly local situation, which ties into the general program. Situated in what is known as Storm Drain Pump District No. 3, the job is the fifth to be undertaken in recent years as construction of a comprehensive storm drain collection system unfolded. One of the first jobs, for example, was the construction of a 90-inch-diameter line along Willow Street. Other sections were then added and the

present job underway consisted of 2,150 feet of 1500-B reinforced concrete pipe of 54-inch diameter. The job extends from the intersection of Atlantic and Columbia Boulevards to the intersection of Elm Avenue and Patterson Street, all within the north central district of Long Beach. So far, this area is not affected by subsidence.

Several factors influenced the location of the storm drain at the present alignment. In general, the new storm drain follows a natural watercourse leading from oil derricks on Signal Hill, passing down through an area known as the "Frog Pond," and thence passing to a storm drain pump station built by the city of Long Beach to serve that area. Construction of the storm drain at that point is expected to eliminate the unsightly, debris-filled watercourse. City officials expect private property owners along the watercourse to fill in much of the area after the pipe is laid.

The old watercourse has long been the source of a waste oil pollution problem. While construction of the storm drain will not eliminate that entirely, it is expected to alleviate it to some extent.

The V. C. K.—Bebek job will round out a rather comprehensive storm drain system in this highly critical district. The pump station already has been built. It includes three 36-in. vertical mixflow propeller-type pumps, each unit driven by a 300-hp General Electric motor. The station also has two 48-in. pumps with 500-hp motors, capable of delivering 120 cubic feet of water per second per unit. The total capacity of the District 3 pump station is about 450 cubic feet per second. The station also has necessary switchboards and a five-ton traveling crane.

Hazards on the Course

From a contractor's point of view, some extremely interesting construction problems were created by the design of the job. The location of construction work in a natural watercourse incorporated the usual hazards of working in the bottom of a stream bed. Further, to complicate matters, a great deal of timber, drill junk, used cable, and other debris had accumulated in the bottom of the ditch over the years. Waste oil, drill mud, and petroleum ooze were evident everywhere.

The location of the pipeline crossed one of Long Beach's "problem districts," a highly congested section populated by streets, utilities lines, and numerous oil well derricks. None of these facilities, of course, could be moved. So the field problem was how to construct the line in the shortest period of time consistent with good economics. The job simply had to proceed rapidly in order to reduce the time element of vulnerability to flash floods in the bottom of the wash.

The combination of these peculiar conditions practically dictated the only

Continued on page 30

This is "Frog Pond." Completion of storm drain will probably result in filling of old lake and general improvement of area.

● Because of the special M-R-S principle of operation using a big, rugged four-wheel tractor powering a four wheel scraper, M-R-S tractors offer the contractor greater hauling capacity per unit—greater production per dollar of equipment investment and lower operating costs to charge to each yard of dirt moved. The contractors' equipment investment may be further reduced by the use of big four-wheel scrapers he already owns.

●Extra traction made possible by the exclusive hydraulic M-R-S weight transfer device coupled with the proper balance between engine power and soft low pressure tires enable M-R-S tractors to assist the push tractor to secure heaping payloads in minimum time and distance.

• Two M-R-S 190 tractors powering 19.2 cubic yard struck capacity scrapers secure heaping loads on Mississippi section of Natchez Trace Parkway.

PRODUCTION: 152.6 c.y. per hour
HAULS: 2,296 ft. average one-way

Based on actual payroll figures and official estimates three M-R-S 190 tractors average 152.6 c.y. per hour each for a total of 1,844 hours for production totaling 281,397 cubic yards.

R. G. Brown, Jr. and Company of Louisville, Mississippi chalked up this top grading record with three M-R-S 190 tractors powering 19.2 cubic yard struck capacity scrapers on this contractor's Natchez Trace job in Mississippi.

Covering a period of fifty-nine calendar days this impressive production record was compiled from official estimates of work performed and actual operating hours for which the M-R-S 190 operators were paid.

The figures are even more significant when looked at in the light of unfavorable weather conditions encountered in this season of the year and the hilly terrain requiring the negotiation of intense grades.

Records such as this eliminate speculation on the performance you can expect from M-R-S tractors. Contact us today for details on M-R-S tractors and why these modern prime movers can mean more profits for you.

INVESTIGATE
BEFORE YOU INVEST

THE EMBLEM OF DEPENDABILITY
M-R-S MANUFACTURING COMPANY
FLORA AND JACKSON, MISSISSIPPI, U. S. A.

Top left: Muck pan dumps dirt from pipe jacking operation. Top right: Under street crossing men cut tunnel with clay spade.

Long Beach . . .

Continued from page 27

course which the contractors' management could follow. Congested working space in the bottom of the old drain ditch made it impossible to assign more than the bare minimum of equipment units. In many places, no working area existed at all; it had to be built first by bulldozer. One of the latest bits of information which the contractor received was that the old ditch had been used in 1933 for the disposal of hundreds of cubic yards of broken concrete and other masonry rubble left over from the Long Beach, Compton earthquake. That choice tidbit was not calculated to give the contractor much peace of mind.

The storm drain ditch was no small piece of excavation, either. Twenty-seven feet deep at its deepest point, the ditch consisted of a 6½-ft. bottom with ½ to 1 in. side slopes. Even in its shallowest sections, the trench was 19 feet deep. Obviously, excavation was a job for large, powerful equipment, capable of digging one of the worst conglomerations of material a storm drain has ever been laid in.

The contractor had recently purchased a Bucyrus-Erie 38-B dragline, and after considering the job quite carefully, Bebek's management decided to move that rig in. Equipped with a 50-ft. boom and a 1½-yd. Pettibone Mulliken bucket and H & L teeth, the rig went to work. There was an International TD-14 tractor, carrying a Bucyrus-Erie cable-controlled dozer, for building a work road ahead of the 38-B.

Two-Rig Solution

One of the most unusual features about the job was that those two pieces of equipment comprised the entire list. Later on, minor equipment would be used to help jack some of the 54-in. pipe under several streets and a railroad, but the entire 2,150-ft. pipeline job was scheduled around those two units.

General Superintendent George Sachen explained it this way: "This was just one of those jobs where congestion was so terrific and the progress we could expect was so limited that it was foolish to overstaff the job with manpower. There was room on the ditch for the 38-B, but nothing else. The best we could hope for in that tangled mess of oil, mud, drill pipe, old washing machines, furniture, broken concrete, boulders, and what have you, was from 30 to 40 linear feet a day.

"Since our production was limited automatically to four or five 8-ft. joints each day, it was also obvious that the one machine should excavate the trench and handle the pipe sections. We've worked that way consistently. Our labor force included a laborer, the 38-B operator, his oiler, and myself.

"It's one of those situations where common sense has worked beautifully. We're staying on top of the job. We've saved money in spite of the fact that the excavation was some of the toughest I've ever seen."

As a matter of fact, reference to the "Frog Pond" wash as "tough" is a masterpiece of understatement. The storm drain right-of-way through the old ditch bottom included almost every-

Here are (L to R) Chief Inspector George Nelson, George Sachen, general superintendent, and Bob Gray, engineering inspector.

thing in the book with difficult obstacles thrown in for good measure.

"We thought we'd found everything under the sun in this job except an oil well," the dragline operator grinned one day, "but now we've found that. We broke out a big chunk of concrete with a skull cracker this morning, and it turned out to be an old drill platform. The conductor pipe is still sticking up from the side of the trench."

Aside from the infinite variety of debris and waste oil from the fields which lay in the way, some of the native formations also were quite difficult. Much of the trench cut through a stiff yellowish-blue clay, extremely dense and hard. There was also a sandy formation, some of it cemented to the point where abrasion on the digging bucket became quite a problem. The varying characteristics of the material could best be summed up by saying that half was too hard to dig and the other half was too soft to stay in the dragline bucket.

Despite these difficulties, however, the 38-B Bucyrus-Erie dragline started in at the lower end of the job and backed gradually toward the upper end. It did the complete job as it worked. It dug the trench to the necessary depth and cast the material to one side where it would be out of the way temporarily. In some of the old oil sumps where petroleum material was pumped and wasted, and in places where drill mud was found it was ponded to one side temporarily. This was often done with the help of earth dikes, so that at several stages the job was highly vulnerable to an unseasonal rain. The steady day-to-day production, however, soon had that situation whipped.

Pipe Handling

It was impossible to use concrete pipe sections in lengths longer than eight feet, chiefly because of the scarcity of working room. The pipe sections, manufactured at the South Gate, Calif., plant of American Concrete Pipe Co. were trucked to the job and unloaded, where possible, by the truck's unloading machinery. In many places, however, this was impossible, so the 38-B dragline was forced to double over as a crane to unload and stack the sections until the time came to install them. The scheduling of pipe shipments was one of the most carefully controlled phases of the job, since it was undesirable to have too much pipe laying on hand while excavation and other work was in progress.

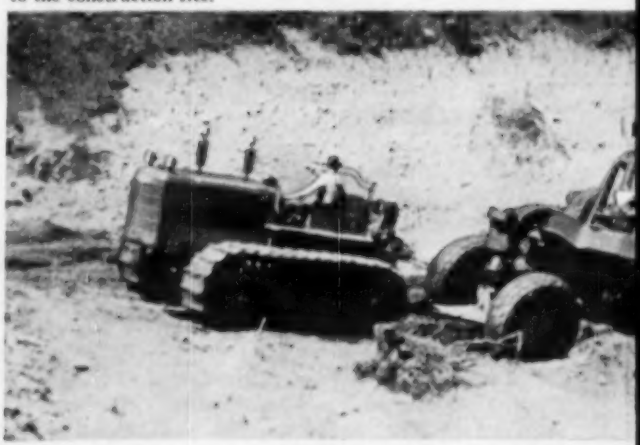
The concrete pipe sections were lowered into the bottom of the trench by setting the digging bucket aside temporarily, still hooked to the drag cable, and transferring the load line to a belly-type sling around each pipe section. In almost every case where the first of two or three sections was picked up for installation, it was necessary to use the 38-B with its boom almost flat. Virtually every one of these lifts saw readings of not more than 10° on the boom angle indicator. Despite this situation, however, the 38-B made its lifts safely and quickly. The sections were lowered in gently and set down on a hand-shoveled subgrade prepared by General Superintendent George Sachen and the one laborer which he employed on the job. The 38-B machine, before leaving the

Continued on page 38

DAM FOR CORDRY LAKE, 700 feet thick at the base, is built by this fleet of three INTERNATIONAL TD-18A crawlers and scrapers and one INTERNATIONAL TD-14A with hydraulic dozer used for push-loading on inclines and in soft spots, and some other equipment.

LAKE LEAKAGE is eliminated by removing all porous soil and stone from the site of the dam base and replacing it with impervious clay fill from distances up to 1,000 feet from a nearby hill.

BUILDING UP THE DAM BASE moves along on schedule as one of three TD-18A scraper combinations brings a heaping load of clay to the construction site.



Moves 1,000,000 cubic yards to build a lake

Howard Prince, veteran Indiana contractor, has used INTERNATIONAL crawlers to build more than 100 lakes since 1935—and he has two large lakes under construction right now!

A water shortage is being remedied and a new vacation area opened by a chain of fourteen lakes being built across Brown County, Indiana, by veteran lake builder Howard Prince, head of the Prince Lake Building Company, Nineveh, Indiana.

Latest and largest in the chain is Cordry Lake, the 103rd lake to be built by Prince.

Cordry Lake, which will eventually cover more than 600 acres, is being created by building a dam 750 feet long, 120 feet high, across two small streams. In excavating unsuitable material from the dam site and borrowing leakage-proof clay from a nearby hill, the lake builders will move over 1,000,000 cubic yards of dirt.

The entire job is being handled by Prince's fleet of seven INTERNATIONAL crawlers with matched IH scrapers and blades, and some other equipment.

Howard Prince has been an INTERNATIONAL owner ever since he first started in business, and states: *"I bought my first* INTERNATIONAL *crawler in 1935 and I've been using them ever since.*

"I've been increasing my INTERNATIONAL *equipment until I now have three TD-18As with scrapers, two TD-14As with blades, a TD-9 and two TD-6s on this job.*

"On lake building projects, as well as all other types of work, they have proved both dependable and economical through the years."

Get the same information that has enabled this successful contractor to make such wise equipment buys for 20 years. Call your INTERNATIONAL Industrial Power Distributor today. From the world's most modern line of earthmoving equipment he'll select the machine "right" for your job and demonstrate it on your job any time you say.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL HARVESTER

INTERNATIONAL INDUSTRIAL POWER

MAKES EVERY LOAD A PAYLOAD

REMEDY FOR NATURE'S OVERSIGHT. The Brown County Lake Development project is adding immeasurably to the natural beauty of that Hoosier county by building 14 lakes in an area that has all the scenic wonders except lakes.

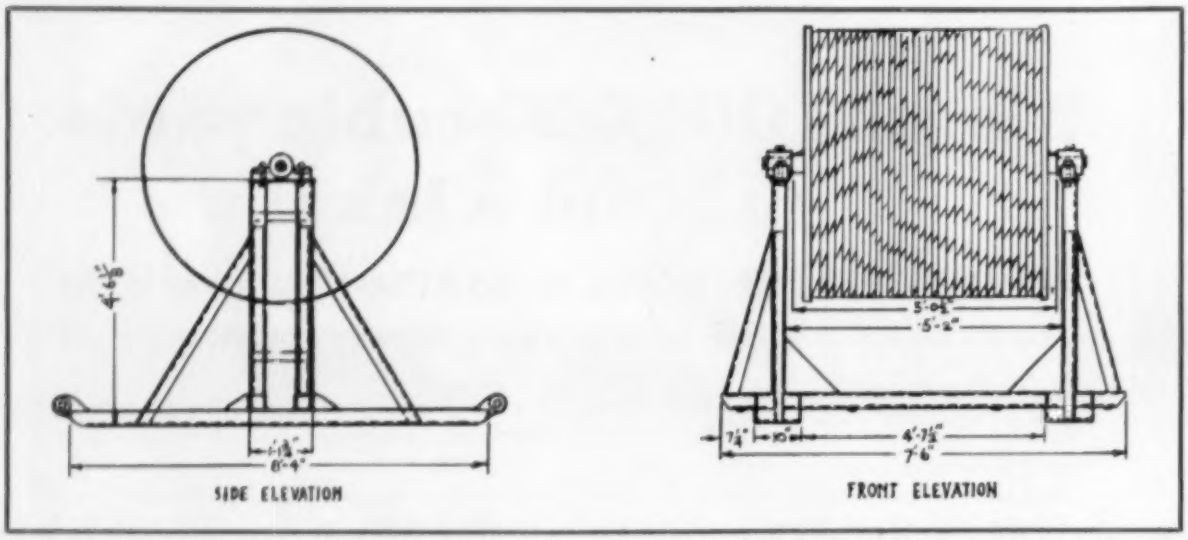


Fig. 1 shows the special sledge or skid designed by the company for moving a 2,700-ft. reel of wire rope around the mine site.

Rope Changing on Large Excavators

by

N. Wilson, Mechanical Superintendent, The Electricity Trust of South Australia, Adelaide, S. A.

A few tools help cut down-time required to change large walking dragline's wire ropes. Here's the procedure followed in the coal mines of The Electricity Trust of South Australia.

Here is a Bucyrus-Erie 9-W dragline similar to the one at Leigh Creek coal field.

WITH the commissioning of the Bucyrus-Erie 10-yd. dragline at Leigh Creek Coal Field in November 1950, and with other large excavators coming forward, some thought had to be given to an improved rope changing technique to reduce down-time of the machine to a minimum.

The problem was first divided into four parts, namely:

(A.) Purchase and storage of the rope and its transport to the machine as required.

(B.) The reeving of the new rope and removal of the old one.

(C.) Measuring the new rope.

(D.) Recording the use and life of the rope.

Taking the Bucyrus-Erie 9-W machine as an example, the following statistics will give a better picture of the job:

Length of the boom ..... 160 feet

Height from the ground to the boom point sheave on present setting ..... 94 feet

Hoist rope, 380 feet long, 1¾-in. diameter 6x37 Warrington, I.W.R.C. . . Approx. 5 lbs. per foot run

Drag rope, 220 feet long, 2-in. diameter, 6x19 Seal, I.W.R.C. . . approx. 7 lbs. per foot run

The hoist rope installation procedure is as follows:

(A.) *Purchase, Storage & Transport.* The hoist rope is bought in lengths of 2,700 feet on reels. These reels are drawn from the store as required and are mounted, on axles, on special sledges (see Fig. 1) so they can be towed around

the cuts by bulldozers. These are very stable and experience has shown that they will go where jeeps will go.

When the rope has to be changed, the sledge is towed down to the cut, and is parked near the bucket, which has been lowered to the ground under the boom, with the padlock sheave resting on the ground behind it.

(B.) *Reeving The Rope.* To get the new rope into place, it was decided, after a lot of experiments, that the best method was to couple it to the old one and simply wind it on to the drum. This required some clamp which would pass through the openings of the boom point sheave and the guide sleaves. The boom point sheave, which forms roughly a round bottom "V"—4 inches by 3½ inches—has a guard almost touching it in two places to prevent the rope jumping off in service.

Two sets of guide sheaves are fitted on this machine, one being mounted on the boom itself, and the other inside the front of the cab. The opening between these sheaves through which the joined ropes must pass is 2 inches by 2½ inches.

Finally, after a lot of trials, a small clamp (Fig. 2) was evolved. This is used as follows:

The outer strands at the end of the new and old ropes are cut away, leaving about 12 to 18 inches of the I.W.R.C. These are clamped together side by side with three of the special clamps, and can thus easily be wound through the sheaves. In tests with the spring dynamometer, two of these clamps were tightened on to the I.W.R.C. and a load of 3,000 lbs. was applied before they slipped. As the weight of the vertical section of the new rope is only about 470 lbs., it was thought that three clamps would ensure no possible slips.

To install the rope, the machine is stopped with the bucket and padlock sheave lowered, as described in part (A). The old rope is cut off with an oxy-acetylene torch, the end is prepared as above, and the new rope is shackled on to it. As soon as this is done, the new rope is wound on until it reaches the drum. The I.W.R.C. is then cut off to leave a square end on the new rope, and this rope is laid to one side. The old rope is fed out through the fairlead to the waiting bulldozer, which hooks on to it with a special clamp (Fig. 4), and pulls it away as it is unwound off the drum with the motor. When it is all off the drum, the clamps are undone (an electric impact wrench being used to expedite this job) and the tractor tows the rope to the scrap rope dump. The new rope is clamped on, again using the impact wrench, and the rope is ready for measuring.

(C.) *Measuring The Rope.* To expedite this very important phase of the operations, the new rope is wound on until a pre-determined number of turns are on the drum. This is measured with a "coat-hanger" template (Fig. 3) and is correct when a marked point on the drum is on top center. With this much rope on the drum, the correct point to cut it is where it just touches the ground. This is marked, the rope is cut, and with the aid of the special clamp is pulled back to allow a little slack, so that it can be fitted into the rope socket. When this is all completed, the bucket is hoisted to the boom point sheave to check the rope length, the 'dozer removes the remainder of the new rope on its sledge, and the machine starts digging again.

With all these aids, the time for a rope change has been reduced from over eight hours for the initial change to from three-quarters to one hour at present.

Drag Rope. With this rope, a slightly different procedure is adopted, as it is not necessary to join the old and the new rope together.

The rope is bought in 1,100 ft. lengths and is mounted on a sledge, similar to the hoist rope, so that the whole

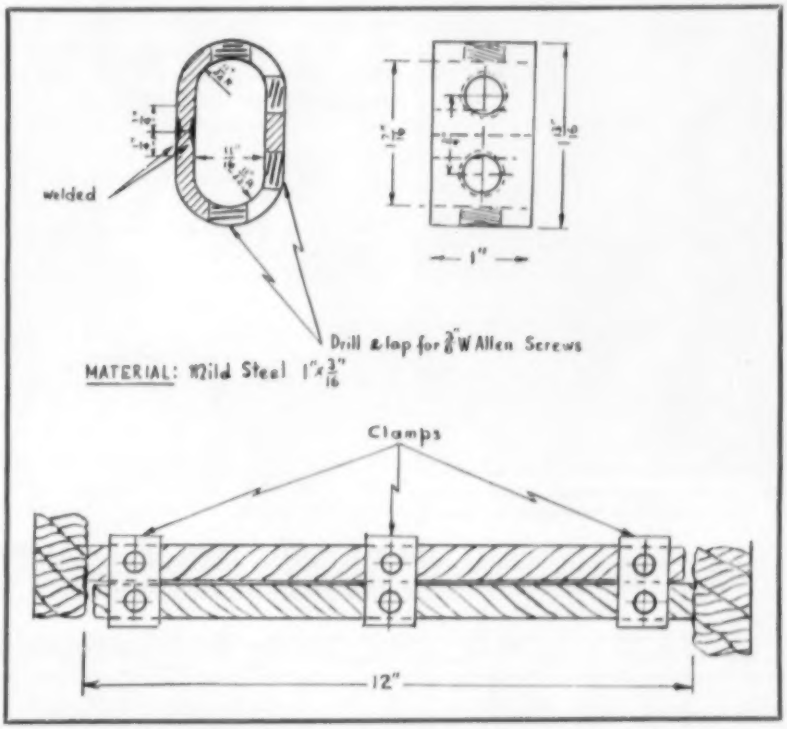


Fig. 2 shows the type of small clamp and how three of them are attached to the cores.

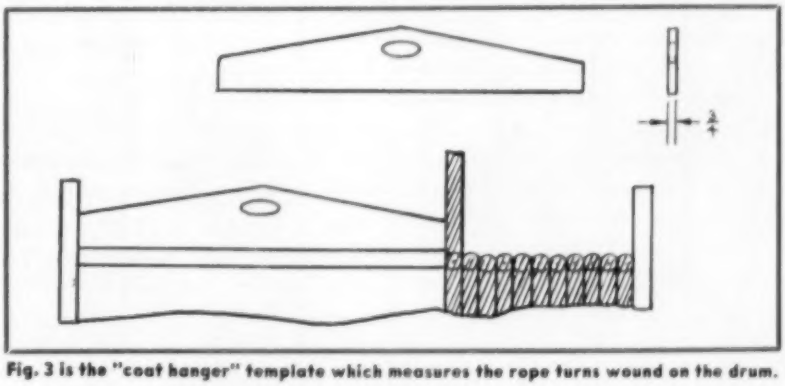


Fig. 3 is the "coat hanger" template which measures the rope turns wound on the drum.

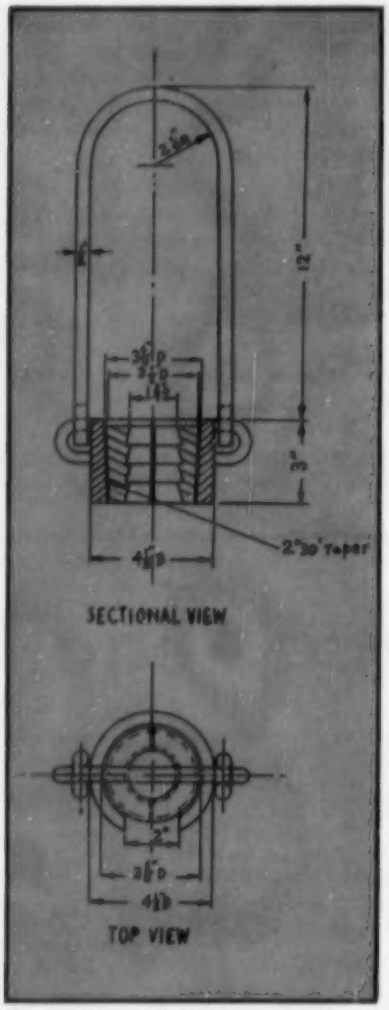


Fig. 4 is the special clamp which fastens to rope when it is unwound or pulled.

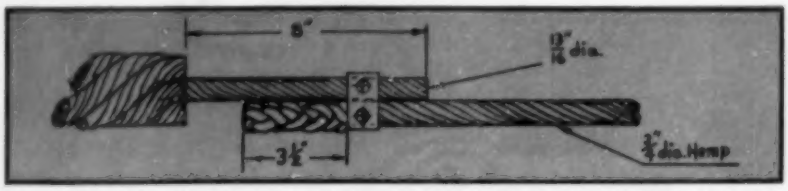


Fig. 5 shows how Manila rope is used to draw new drag line through rig's fairlead.

rope can quickly be brought into the cut and up to the machine. The end of the new rope is prepared in a manner similar to the hoist rope, and a length of ¾-in. Manila rope is clamped on with the special clamps, (as shown in Fig. 5). When everything is ready, the machine stops work and lowers the bucket to the ground at a point 30 ft. from the fairlead to the drag-rope socket on the drag chains. It is immediately cut off with an oxy-acetylene torch, the tractor hooks on with the quick-acting clamp and the rope is run off the drum. When it is completely unwound, the clamps are undone with the electric impact wrench and the tractor hauls it to the scrap rope dump.

In the meantime, the new rope is warped into the cab through the fairlead, using the ¾-in. Manila rope to pull it in, and is clamped to the drum, again using the impact wrench to expedite the job. As soon as it is clamped tight, the rope is wound on to a predetermined point, which is measured in a similar manner to the hoist rope. The rope is then cut off level with the rear end of the bucket to give enough slack to insert it in the socket. As soon as this is done, the bulldozer removes the remainder of the new rope on the stand and the machine starts working again.

(D.) *Recording The Use And Life Of The Ropes.* With the machines working on shift work, there is always a tendency to lose track of ropes as they are installed or removed, especially the trip (dump) rope on large machines, and all the ropes on the smaller machines. To overcome this, a monthly chart (see Fig. 6) was devised. These charts are carried in the operator's cab of each machine and are replaced on the first working day of each month. All installations, etc., of ropes are recorded on the chart during the month. The completed chart is taken to the Plant Maintenance Office, where the hours-life of each rope removed during the month is worked out from the records. From here, the chart goes to the Production Department, who work out the tonnage dug by each rope during its life, and also the type of digging. Finally, all the details from the chart are entered in a Rope Log Book for future reference and for comparisons to be made between ropes supplied by various manufacturers.

A big variation in the life of various ropes has already been noted but our records, as yet, do not cover a long enough period to go into this more fully.

(1) M.S.
(2) O.C.S.
(3) M.S.

THE ELECTRICITY TRUST OF SOUTH AUSTRALIA

LEIGH CREEK COALFIELD ROPE LOG — MONTH YEAR

Machine No. _____

DATE	TIME	ROPE	DRUM No.	OPERATOR	L/H FITTER	HOURS WORKED	TONS/YDS. DUG	TYPE OF DIG	REMARKS

Fig. 6 is the chart installed in every machine on first working day of the month. It helps firm learn about rope performance.

IN CALIFORNIA . . . AND THE WORLD OVER

In this quarry at Colton, the powerful 150-B shovel with its 6-cu. yd. dipper has no difficulty in breaking through tough limestone.

Rock meets its master

WITH A BUCYRUS-ERIE SHOVEL ON THE JOB

In a California quarry, this Bucyrus-Erie 150-B shovel is digging and loading hard limestone, delivering outstanding output. This performance story is being repeated daily in quarries, mines and on heavy-duty construction projects throughout the world.

New front-end design, extra-strong construction, and advanced engineering of Bucyrus-Erie Ward Leonard electric excavators give owners that extra margin of output that pays off in profits.

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150-B . . 6-cu. yd.
190-B . . 8-cu. yd.
BUCYRUS ERIE

Bucyrus-Erie Company

South Milwaukee, Wisconsin

Long Beach . . .

Continued from page 31

work area, tossed a few buckets of the best backfill material in the general area over the newly laid pipe sections. This was done as gently as possible to protect the joint mortar coat which was placed just as soon as the sections were laid. The final backfill was shoved in by the International TD-14 dozer, after which a thorough job of compaction by flooding and jetting was done. The entire job, from one stage to another, remained closed up within the space of several feet. This was done to protect the pipeline as much as possible. The final cement mortar coat to seal the interior pipe joints was applied in two stages; the second stage after the flooding had been done.

The unexpected advantage of a small crew working under the close supervision of the General Superintendent was evident from the start. The finished storm sewer looked about as true as the inside of a rifle barrel. Beautifully finished grades and lines can be put up under these conditions, especially when the subgrade is prepared uniformly, each pipe section is lowered in place the same way, and sufficient attention is paid to the filling of the joints at the proper time. During the 1953 work season, the same contractor built a 72-in. line in another part of the city. That job still stands as a model of storm drain construction, according to every responsible Long Beach City engineering official interviewed by this writer.

Because of arterial traffic on busy Atlantic Blvd. and American Ave., it was impossible to excavate an open ditch for placement of the storm sewer. The line also intersected the railroad tracks of Pacific Electric Railway. At these points it was necessary to use hydraulic jacks and an underground mining operation to push the pipe through under these busy arterials. Slightly stronger pipe than 1500-B was used at these locations, but the general line and grade remained the same as for the ditch.

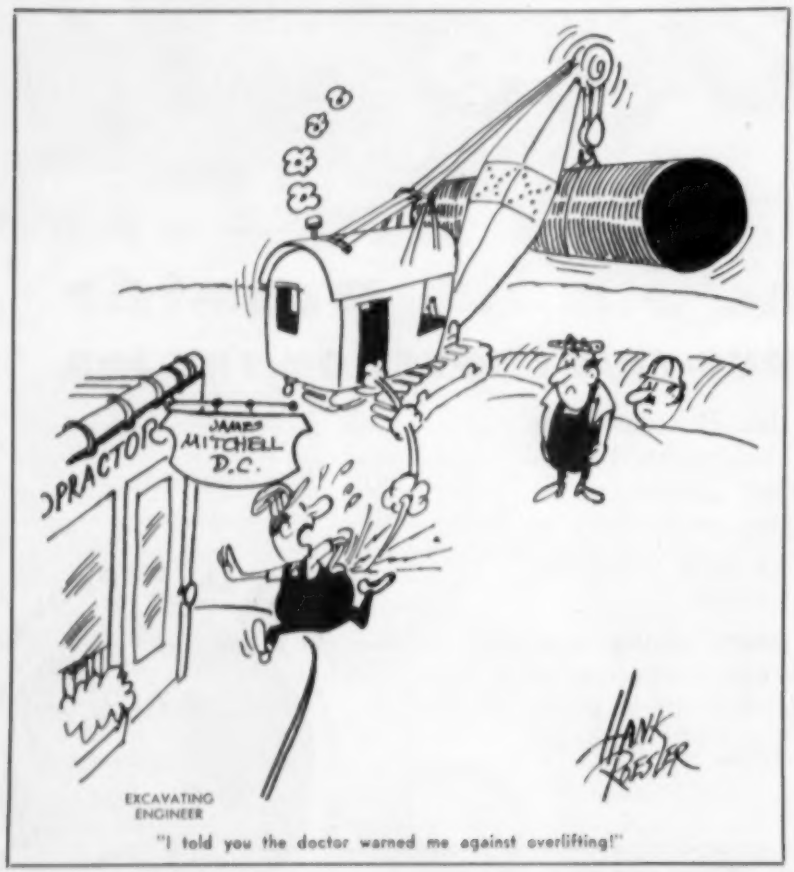
The jacking job at American Ave. was possibly the most interesting of all three. It was necessary here to work from both headings, jacking the pipe in toward a manhole in the center of the street. This involved a 44-ft. push one way, and a 36-ft. push the other. It was done so beautifully that the manhole was intercepted exactly both for line and grade, although Long Beach's Engineering Department had planned to reconstruct the manhole after the pipe jacking operation was finished. It was found to be unnecessary because of the beautifully precise job which had been done.

V.C.K.—Bebek does its own pipe jacking. The adit or shaft for the operation was excavated by a P&H 655-B crane, rigged with an Owen clamshell bucket. The excavation operation at the pipe heading was a job for a LeRoi 105-cfm compressor, a Thor clay spade, two laborers, and a small mine-type car. After the labor crew had clay spaded and excavated the necessary material from a foot or two of heading in front of the pipe section, it was pushed ahead by two Greenlee hydraulic jacks and two sets of jacking tracks. Hydraulic pressure on the two jacks was synchronized so that the pushing pressure was constant throughout. On the Long Beach job it was not even necessary to make the customary minor adjustments for drift or raise or fall, which pipe jacking crews often have to cope with.

The V.C.K.—Bebek job, whose contract amounted to $95,000, is a splendid example of mechanization applied to restricted or confined locations. Set up on the basis of approximately one linear foot of production per working hour, the job moved ahead steadily in spite of all the difficulties. Started the 1st of September, it was already well out of danger by mid-November, and project officials expected final completion for not later than the 1st of December. The job will create an important new addition to Long Beach's already impressive storm sewer system, and what was formerly an unsightly dirty watercourse laden with debris can now be filled to create important new real estate.

Design and supervision of the storm drain project was under the general supervision of City Engineer Jess D. Gilkerson, who was assisted by Chalmers Bower, Division Engineer, and C. S. Thompson, Head Designer of sewers and storm drains for the city of Long Beach. Overall conception of the program was under the general supervision of Samuel Vickers, City Manager.

All supervision for the contractors was under the general direction of George Sachen, General Superintendent, who acted as supervisor, coordinator, planner, and most of the labor force, with limited help.



"I told you the doctor warned me against overlifting!"

South Milwaukee, Wisconsin

Manitowoc 2000
dives for dollars

here are the "2000" features:

Faster Working Cycles
Faster hoist speed—swing speed

•

Efficient—Economical
Simple design—only 13 working gears

•

Greater Capacity
(45 ft. crane boom—50,000 lbs.)

•

Easily Converted
Shovel—Dragline—Crane—Hoe

•

Less Ground Pressure
6.9 to 13.0 lbs./sq. in.

•

Long, Wide Crawlers
12'4"—14'7"—16'10"

EVEN THOUGH it's up to its "travel shaft" in water—this Manitowoc 2000 is packed with profitable action! Assigned to handle the toughest part of a $250,000 Washington State Highway Commission job for Cherf Brothers near Kennewick, Wash., this Model 2000 is slugging it out with rocks, boulders, clay, sand, gravel *and water* at the rate of 1000 yards per shift, sometimes working around the clock. Frequently this 1¼ yd. rig has to submarine its oversize bucket to a depth of 9 feet under water to get its load!

A smooth functioning torque converter reduces load shocks and boosts operating efficiency. Jaw-type steering clutches and travel gear are fully enclosed—protected from water and dirt. These are the Manitowoc features that permit this kind of wet going.

Got a tough job? Let a Manitowoc take a crack at it—take your operation out of the "red" and end up each shift in the "black".

MANITOWOC
SHOVELS 1-5 YD. Speedcrane CRANES 18-100 TON

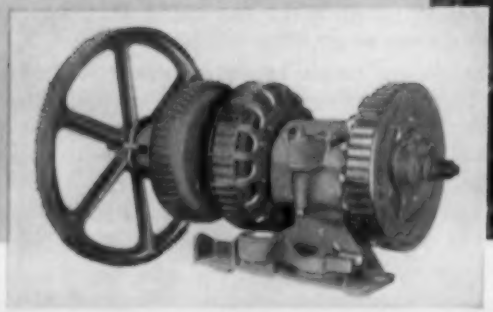
Now!
CUT OPERATING COSTS

A Big 2 Cu. Yd. Machine Designed Especially For Fast, Easy, On-The-Job Conversion

THE "RIGHT" SIZE — Big and strong enough for impressive yardage in rock, shale and dirt. Small enough to travel easily on a rail car without major dismantling. Gets around easily in close quarters.

EASY FIELD CONVERSION — Easily convertible in the field from shovel to dragline, clamshell, crane, hoe or pile driving service.

TORQUE CONVERTER — Automatically gives operator extra torque as needed, extra speed when load is light. Protects machinery from shock. Makes all-around better use of available engine power.



NEW, SELF-COOLING SWING CLUTCHES —The use of aluminum friction shoe carriers with fins and air passages on clutch housing and large holes in the friction housing assure cool performance.

SELF-RAISING GANTRY — Powered up or down quickly. High, retractable gantry decreases stress on boom for crane work.

with THE 83-M

• Excavating • Slugging It Out On The Rock Pile
• Pouring Concrete • Setting Steel • Driving Piling

FEATURES THAT COUNT!

A BIG CRANE — Handles 60 tons on 50′ boom at 12′ radius. Wide crawlers on 12′ 11″ centers available for extra stability.

WORM TYPE BOOM HOIST — "Power up and power down" boom hoist optionally available to permit simultaneous propelling or swinging and boom hoisting.

THIRD DRUM—An optional third drum permits hanging suspended leads, handling of piling, snaking in or snubbing loads or for use as a high-speed boom hoist.

AIR CONTROL SPEEDS PRODUCTION — Only 12 pounds of hand pressure on the compensating-type air control valve releases full machine power for increased production, reduced operator fatigue.

ANTI-FRICTION BEARINGS — Roller or ball bearings, sealed against dirt and fitted for easy lubrication, at all principal friction points. Gears run in oil bath.

OUTSTANDING CRAWLERS — Self-cleaning, non-clogging crawlers never need attention. Belt tension easily adjusted.

See your nearby distributor today.

MARION • OSGOOD • GENERAL O-G

MARION POWER SHOVEL CO. • MARION, OHIO, U.S.A.

A Subsidiary of Merritt-Chapman & Scott Corporation

POWER SHOVELS FROM ½ TO 60 CUBIC YARDS
PILE DRIVERS • WALKING DRAGLINES

DRAGLINES • CLAMSHELLS • CRANES • BACKHOES
TRUCK CRANES • MOBILCRANES • LOG LOADERS

Your Confidence Is Justified Where This Flag Flies

Close-up of Bucyrus-Erie 150-B shovel dipper reveals dual hoist ropes connected to equalizing sheaves on each side of dipper, for unwavering path in tough digging.

Fort Randall . . .

Continued from page 23

tion. This material came from a pit located on the south bank just back of where the only landmarks of the old fort remain: the Fort Randall chapel and officers' quarters.

Haul units, 38 Euclids in all, are divided as follows: six 13-yd. with GMC 671 power plants; ten 17-yd. capacity with 6-110 GMC power; and twenty-two 25-yd. capacity with Buda, Cummins, and GMC Diesels pretty well divided. But List and Clark upped the Eucs capacity by welding 9-in. high sideboards furnished by Euclid on the bodies, so that a 25-yd. capacity truck, for instance, was then figured as a 30-yd. capacity unit.

With the average haul running two miles one-way, the trucks were averaging three to four loads per hour per unit, over haul roads kept in excellent condition. Constant patrolling by Caterpillar Model 12 road graders kept spillage off and to the side of the roads and two 5,600-gal. capacity Euclid water wagons held dust down. Dust not only caused drivers no end of discomfort but turned up as a cause of major engine repairs if not controlled.

In between the load and the dump sites, a complete refueling and lubrication stop was provided to keep equipment on the road as much as possible. Taking a short cut-off from the main haul road, trucks pull over to a pump to fuel up, then move forward a few feet to an enclosed building for oil and grease application and are back on the road with a minimum of time lost.

More serious servicing and major repairs are performed in the company's garage, a 60 x 120 Butler portable prefab. The garage was erected just behind a frame building leased from the government, the latter housing a complete parts shop and office. Another frame structure serves the company's engineer and office manager and their staffs.

A two-way radio center is located in the office building to facilitate communication among supervisory personnel, service trucks, and home base. Of the firm's fourteen one-half-ton Ford pick-ups, six are equipped with RCA two-way radios.

Rounding out the time-saving maintenance facilities are two 600 gal. fuel trucks (Ford) to supply power shovels, tractor equipment, etc., while on the job.

To keep men on the job refreshed, one of the pick-ups is equipped as an ice truck. It does nothing but supply thermos jugs with enough ice to make drinking water palatable.

One foot of blanket sand, one foot of spalls and three feet of riprap are used as protection for the slopes on the spillway approach and the embankment where chalk blanket could not be employed due to the limited space. List and Clark placed 20,000 cubic yards of riprap for this type of slope protection, 9,000 of which was shipped in from Quartzite Quarries near Dell Rapids, S. Dak.; the remaining 11,000 yards of boulders were obtained from the unclassified excavation.

Rolled fill placement is executed as follows: The protecting lift is scarified and watered, if moisture is required, to insure a bond between it and the succeeding layer. After the new material is dumped it is spread and leveled to a one foot thickness and rolled with a pneumatic roller. The sheepsfoot rollers were used primarily to break up the large clods of dirt to facilitate handling during the spreading, and also to roll the shoulders where inaccessible to the pneumatic roller.

All of the dam proper is to be seeded, and List and Clark will seed 106 acres

Euclid bottom-dumps fill on dam proper as two of Allis-Chalmers-Caterpillar team of 14 tractor-dozers spread in thin lifts.

using 20 pounds of grass seed to the acre, as specified.

As for taking out the plug—a job well under way with the two Northwests, Manitowoc, and Bucyrus-Erie excavators doing the loading out—about 30,000 cubic yards of chalk were being handled daily, in two 10-hour shifts. The firm began moving the chalk, 4,560,000 yards in all, on Dec. 8, 1953. The two 80-D's with oversize 4-yd. dippers averaged near 9,000 yards, but had a peak of 10,489 yards on one particularly good day. Swinging an 8-yd. Hendrix bucket, the Manitowoc averaged 11% better, hitting around 10,000 yards a day. And the electrically-powered Bucyrus-Erie 150-B went above that figure, on the average, attained a peak of 12,377 yards for its top total in two shifts.

Soon as darkness sets in, List and Clark's fleet of light towers is put to use. The company made them from radio towers which were purchased from a firm manufacturing several sizes to suit most any prospective customer. Sixteen 1,000-watt light bulbs are mounted on each tower, with a Caterpillar D311 Diesel-electric generating unit providing the power for each of the eight trees.

Two pumps were going most of the time. The two, an 8-in. Fairbanks-Morse electric turbine pump and a Gorman-Rupp 6-in. irrigation pump powered by Chrysler V-8 industrial engine de-water. The turbine pump is operating in a well drilled through the downstream chalk berm to the old river bed at about 120-ft. depth by Western Contracting Corporation for their previous contract.

Wet Blasting

The top of the chalk bed rock in this area rises, at the highest point, to an elevation 12 feet above the spillway floor. The contract specifications required drilling and blasting this chalk above grade to the extent necessary to secure breakage of ⅓ cubic yard maximum particle size. Blasting the river sand and silt is not required where the underlying chalk is below the level of the spillway floor. The contractor developed a procedure used to load and shoot the chalk.

The contractor's forces designed a portable, double-casing arrangement 34 feet long with a heavy sliding crosspiece on the upper portion to act as a pile driver. The smaller diameter pipe (4-in.) sets inside a larger (5-in.) pipe leaving a gap in between the two, run-

Continued on page 44

In response to demands for trailers lighter than our standard line but capable of meeting average needs, we have designed our LT trailers in capacities of 15, 20 and 25 tons.

They embody basic Rogers design developed through decades of specialization, are built of Mayari, the outstanding light but strong steel and incorporate our popular Model T rear units. Available in level deck types only.

A saving of a full ton is made in the 20 ton size with corresponding weight savings in the other capacities. Of special interest, however, is the attractive price made possible by the simplified but adequate construction.

Regardless of present equipment every heavy hauler and contractor should have one of these new trailers for general utility use.

YOU GET MORE FOR YOUR MONEY IN A ROGERS TRAILER

EXPERIENCE builds 'em ROGERS PERFORMANCE sells 'em

ROGERS BROS. CORP.

ALBION, PENNA. CABLE: BROSITES

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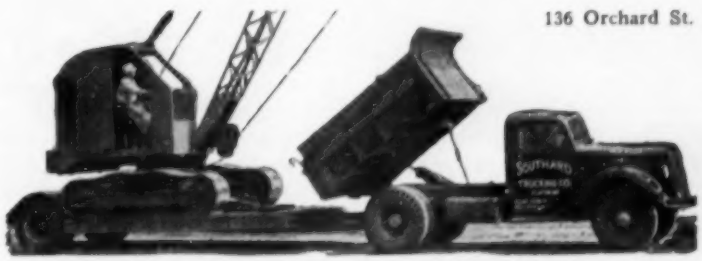
136 Orchard St.



Attaching of loaded Rogers Tagalong trailer

Fort Randall . . .

Continued from page 43

ning the entire length. On hand to handle the device and to drive it down into the hole is a Northwest 80-D crane. As it is driven down to hole bottom, an air blast is developed by a Gardner-Denver compressor to force the material up and out between the two pipes thereby keeping the inside casing clean to facilitate powder loading.

Three sticks totaling 25 pounds are loaded into each hole, tamped down through the inner pipe with the aid of a 30-ft. long rod handled by the crane. The 40% strength Red Cross blasting material is wrapped in extra-heavy packaging to better withstand moisture.

A Dodge heavy-duty pick-up is the haul unit for explosives, and a Ford 2-ton flat-bed hauls the pipe.

Shooting is accomplished with primacord and electric cap, setting off about 10 holes at a time. Considering the elaborate processes involved, the average of better than 25 holes drilled per day stacks up well.

List and Clark's completion date is Nov. 15, 1955 but the company will probably better this target. The company's president is C. E. Clark, Jr. Other officers of the firm include C. E. Clark, chairman of the board; J. W. Frisbie, J. M. Clark, and J. E. Irwin, vice-presidents, and D. W. Davis, secretary. Charles Ing is project engineer; Joe Mundis is in charge of the field office and M. D. Traupel in charge of field personnel.

D. W. Foster assists A. B. (Dean) Peters as superintendent on the night shift. H. A. Burden is shop foreman, and W. L. Meridith is in charge of parts and purchasing on the job.

Equipment You Ought to Know About

Scarifier

Manufacturer: Teale and Company, 1417 No. 52nd St., Omaha 2, Neb.

Claims: The rugged, new, fully-hydraulic Teale Scarifier, available in four models of varying size, rips any hard packed surface . . . rocky or frozen soil, clay, macadam, or shale. The width of the "ripping swath" varies from five to seven feet in the different models, and the number of teeth from six to eight.

The Teale Scarifier enables lighter crawler rigs to tackle tougher digging and excavating jobs without excessive wear. It attaches to the crawler drawbar . . . derives its pull directly from the frame, not the transmission housing. The Scarifier carriage is of a square, all-welded box construction using 1-in. steel plate. Teeth are made of special grader blade steel, and are locked in position with steel wedges that drive them back over a locking bar.

Powerful, twin Prince cylinders give instant, precise adjustment of ripping depth, from a full 9-in. penetration to the full-up position (teeth 20 inches above ground). The heavy duty Teale Scarifier is shipped including twin, two-way cylinders, hydraulic tubing, and selector valve to work with any specified hydraulic system. The Teale is made to fit D-4, TD-9, HD-5, D-2, TD-6, and Oliver A and B, wide and narrow.

Two-Ram Hydrocrane Bucket

Manufacturer: Bucyrus-Erie Co., South Milwaukee, Wis.

Claims: A new ⅛-yd. clamshell bucket, which uses two hydraulically operated rams instead of a single center ram to handle bowl action, has been developed for use with the truck-mounted, all-hydraulic H-3 Hydrocrane. The new bucket has been designed to step up the versatile Hydrocrane's digging output in any kind of going.

Lower ends of the rams are attached directly to the upper edge of the bowl sections. Since the dual rams—one for each bowl—never extend into the bucket, there is no load interference. Use of twin rams, coupled with improved leverage, provides 42% more force to the lips at the point of closing than earlier bucket.

Bucket deck area and internal size have been increased. Struck measure capacity is 10.4-cu. ft.

The bowl sections are curved to provide maximum penetration and quick loading with minimum heeling. In addition, bowl pivot shafts have been replaced with short pins so there is nothing to obstruct loads in the bucket. Holes are also provided in the bowls for side cutter teeth.

The company also provides a quick-disconnect coupling for the tagline hose. It can be attached or detached from the bucket in a few seconds without the use of tools and without oil spillage.

Angling Bulldozer

Manufacturer: Balderson Inc., Wamego, Kan.

Claims: A new angling blade bulldozer has been designed for use with the Caterpillar 74-in. gauge D6 tractor. It's the Balderson Model BAI6X Inside Mounted Angling Bulldozer, built to attach to the engine frame of the tractor, and use Caterpillar hydraulic or cable controls.

Advantages of the engine frame mounting are: The tracks are free to move up and down over rough terrain without putting any twisting strain on the main frame of the bulldozer. The narrower cutting width, either straight or angled, than outside beam dozers, per-

Continued on page 48

PAYLOADER®...
the proven tractor-shovel!

PROVEN EXPERIENCE — 34 years of pioneering and building hydraulic tractor-shovels — more experience than all others combined.

PROVEN PERFORMANCE — 90% of the thousands of "PAYLOADER" tractor-shovels built in the last 15 years are still in service.

PROVEN SERVICE — Some 300 "PAYLOADER" Distributors maintain millions of dollars of parts and service facilities for their customers.

Your "PAYLOADER" Distributor is anxious to prove what a "PAYLOADER" can do for you and help you choose the size and type best suited to your use. See him today or write The Frank G. Hough Co., 708 Sunnyside Ave., Libertyville, Ill.

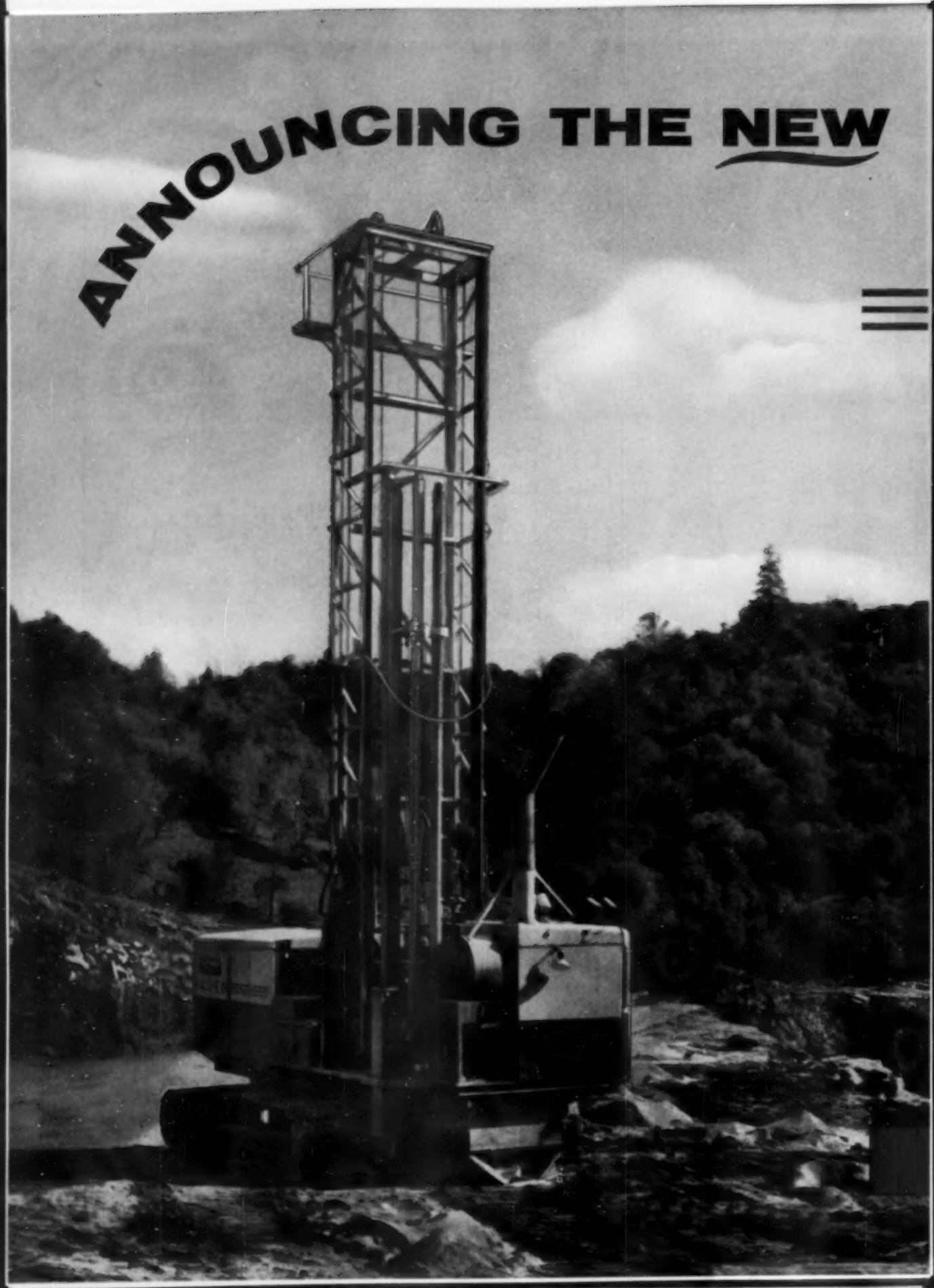
4-wheel drive "PAYLOADER" backfilling trench

PAYLOADER®

THE FRANK G. HOUGH CO. · LIBERTYVILLE, ILL.

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

ANNOUNCING THE NEW



BUCYRUS-ERIE 40-R

A Rotary Drill for 6¾ to 9-inch Holes

Here's big news for quarry and mine operators — Bucyrus-Erie has added another model to its line of rotary blast hole drills. It's the 40-R — designed for drilling 6¾- to 9-inch holes.

Like the bigger 50-R, this new drill features the flexibility of Ward Leonard variable-voltage control, plus this important extra—your choice of diesel-electric or full electric power.

All of the outstanding 50-R performance advantages that have won the praise of drilling superintendents throughout the United States and in Canada are yours with the 40-R, too. Here are some of them:

① YOUR CHOICE OF DRILLING SPEEDS Down pressure on the bit is hydraulically powered for maximum controlled penetration. Ward Leonard electric control on rotation of drill pipe permits drilling at most efficient speed for a given formation. Drilling is continuous for 27¾ feet before an additional drill pipe section must be added.

② EASY TOOL HANDLING Drill pipe sections are added or removed in a few minutes with a remote controlled, power-driven tool handling unit that swings the tool rack over the tool holder, and rotates the rack for storing or selecting the drill pipe.

③ AIR BLAST CLEANING Cuttings are removed from the hole as drilling progresses by a 686 cfm air compressor. Only the "fines" are picked up and handled by a Roto-Clone precipitator. "Heavies" pile up adjacent to the drill hole for use as stemming material.

④ HIGH MANEUVERABILITY Large crawler-type mounting with three point support and 36" treads provides good stability with low ground pressure.

Complete information is yours for the asking. Just fill in the coupon and mail it today.

BUCYRUS ERIE

South Milwaukee, Wisconsin

BUCYRUS-ERIE COMPANY
South Milwaukee, Wis.

Gentlemen: I'd like more information on your new 40-R.

☐ Send a Bulletin
☐ Or better yet, have your salesman call and tell me.

NAME_____

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COMPANY_____

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15855C

This impressive fleet of Byers Truck Cranes is lined up to start a Walsh-Perini-Groves-Slattery Co. construction job for the United States Steel Fairless Plant at Morrisville, Penna.

Four of these cranes are "*Rigged for Results*" for faster, more efficient excavating by being equipped with

OWEN Buckets

Owen wins the approval of leading contractors because of their superiority in handling all excavating, trenching, dredging and rock handling operations.

Owen material handling buckets are just as popular because they are specially designed to meet the wide variety of operations encountered in this field.

Send for free illustrated catalog today.

THE OWEN BUCKET CO.

6095 Breakwater Avenue • Cleveland, Ohio

Branches: New York Philadelphia Chicago Berkeley Calif. Fort Lauderdale Fla

New Equipment . . .

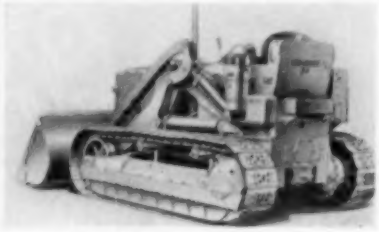
Continued from page 44

mits greater maneuverability, better balanced dozer capacity to tractor power, and more economical operation for special uses. Greater safety on the highway when moving from one job to another because the blade may be angled to come within the safe and legal eight foot width limit of many states.

Tractor Shovel

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: Increased horsepower and faster travel speeds are among the several improvements of the Traxcavator No. 6 Shovel. This machine will give greater production for construction men, loggers, factories, power plants, and



others with the new 2¼ cubic yard bucket and improved bucket action with a new hydraulic pump.

The engine in the new No. 6 now delivers 100 hp at the flywheel.

In addition to the increased bucket capacity from 2 to 2¼ cubic yards, No. 6 Shovels now have a two-position feature that allows maximum use of bucket capacity under normal conditions and obtaining of maximum scouring action and dumping action when handling sticky, hard-to-dump materials. This machine features the outstanding balance characteristics already associated with its predecessor.

The Traxcavator No. 6 Shovel travels at almost 30% higher speeds with increases from 1.4 mph to 1.9 mph in first gear, from 5.8 mph to 7.4 mph in fifth gear, with corresponding increases in other gears.

The new hydraulic pump increases the pressure in the hydraulic system to 1,450 psi. This operating pressure provides greater lifting power for faster bucket action. In addition, the hydraulic system in the new unit will be equipped with a full flow filter.

Crushing Plant

Manufacturer: Universal Engineering Corp., Cedar Rapids, Ia.

Claims: A new TS-Traveler, gravel

screening, crushing and loading plant has been introduced by the manufacturer.

The plant is a completely re-designed version of the original Traveler which it replaces. It consists of a 1½-yd. shovel loading hopper with trap grate, reciprocating 19-in. plate feeder, 2-ft. x 4-ft. inclined gyrating screen, a 1024 roller bearing jaw crusher, 24-in. folding channel frame front delivery conveyor, clutch control, and operator's platform and power in a new arrangement on a pneumatic tired gooseneck truck. The arrangement provides for greater convenience in operation, and results in a more compact, streamlined unit with low feeding height. It is also available with 1016 and 1020 roller bearing jaw crushers.

The Universal TS-Traveler is designed for crush-and-travel operations where production requirements are moderate. Its compact design, low weight, and high portability permit it to be easily transported to out-of-the-way locations. It may be backed up to a gravel bank and fed by shovel or dragline, or fed with trucks from a ramp setup. The reciprocating plate feeder carries the pit run gravel to the screen where natural finish is removed. Oversize is scalped to the jaw crusher. Crushed gravel together with screened material is delivered to trucks or stockpiling conveyors. If desired, the TS-Traveler may be equipped with a two-deck screen and a side delivery conveyor for producing sand.

Universal Traveler plants are offered in three types . . . the TS, the CS, and the CSE for single-pass or closed circuit operation.

Triple Electrode Spark Plug

Manufacturer: Auburn Spark Plug Co., Auburn 3, N. Y.

Claims: A triple electrode spark plug with concave ground electrodes "brings the aviation spark plug down to earth" for use in gasoline-powered construction equipment. This new Auburn TC-3 can be used in all automotive engines to gain four definite advantages: Lower fuel

Continued on page 50

Digs Through Sticky Gumbo and Buried Stumps for 8 Sewer Laterals in 6 Hours with a Sherman Power Digger

"Do it fast." That was the order given to a large general contractor in New Orleans. Their job was to dig eight trenches, each 18 ft. long, 1½ ft. wide, and sloping from 3 ft. at one end to 7 ft. at the other. Soil? Sticky gumbo with 16 buried stamps.

Despite these conditions, a Sherman Power Digger completed the work in six hours!

This is a typical, everyday job for the Sherman. It is used for curb removal, catch basins and trenches of all kinds—electric conduits, water mains, pipe lines and so on. It is compact and easily maneuvered for close-quarter work. Light weight prevents property damage on sidewalks or close to buildings. Because it is tractor mounted, the Sherman moves quickly from job to job, often completing several projects miles apart in one day.

The Sherman Power Digger releases heavier equipment for big jobs, digs in a fraction of the time and cost of manual labor, goes up to 10 ft. below grade in mud, hardpan, shale, oiled roads, blacktop and stony ground. Initial cost is surprisingly low . . . maintenance, simple and inexpensive. Get the whole story in Bulletin Z-55—today.

Designed, Engineered and Manufactured Jointly by
SHERMAN PRODUCTS, Inc.
Royal Oak, Michigan
WAIN-ROY CORPORATION
Hubbardston, Mass.

Patent No. 2,303,852
Other patents pending
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Sherman
PRODUCTS, INC.
ROYAL OAK, MICHIGAN

Moderate cost . . . light on labor
little maintenance . . . BUT

Tons of Performance

Crescent Scraper of 5-cu. yd. capacity—rigged for gravity return—shown returning to excavation point in the pit. Ask for Catalog A and Field Report 214.

SAUERMAN EQUIPMENT

Check digging power . . . rate of haul . . . clean dumping. Add labor economy . . . low upkeep . . . personnel safety . . . moderate power consumption. Total up the score . . . you'll choose one of these Sauerman Machines for your operation.

DRAG SCRAPER: *best* for pit or hill excavation, reclamation or general handling of materials, wet or dry. Serves as rapid, long range conveyor. Sizes 1/3 to 15 cu. yds.

SLACKLINE CABLEWAY: *best* for deep digging — especially underwater — and conveying to a high delivery point. Reaches down a hundred feet or more . . . spans up to 1000 ft. . . . sizes 1/3 to 3½ cu. yds.

TAUTLINE CABLEWAY: *best* for long range aerial work. Lifts, conveys, places loads of unwieldly material. Ideal for dam construction or for conveying loads over streams and canyons.

CRESCENT SCRAPER ON BOOM MACHINE: *best* for increasing the work capacity of any boom machine on backfilling and grading jobs. When scraper is used with track cable and trolley, machine range is greatly extended.

Call on Sauerman's *experienced* engineers for the size and type system *best* suited to your digging, hauling or materials handling requirements. Write for catalogs . . . ask for idea-packed Sauerman News.

Slackline cableway performs difficult excavation of non-caving material from deep pit. 70% rock and 30% colloidal sand posed tough digging job. Ask for Catalog C and Field Report 216.

Tautline Cableway spans 920 ft. to carry 4-cu. yd. bucket of concrete from mixing point to dam site.

Crescent on boom machine dumps large load of wet peat. Bucket is gravity-returned on track cable to digging point. Ask for Catalog J-1 and Field Report 219.

SAUERMAN BROS. INC.

622 S. 28th Ave. | Bellwood, Ill.

New Equipment . . .

Continued from page 49

consumption, more power, less plug fouling and easy cleaning.

In addition to triple electrodes, the TC-3 also adapts the solid copper gasket and high quality 95% plus aluminum oxide insulator used in jet plugs.

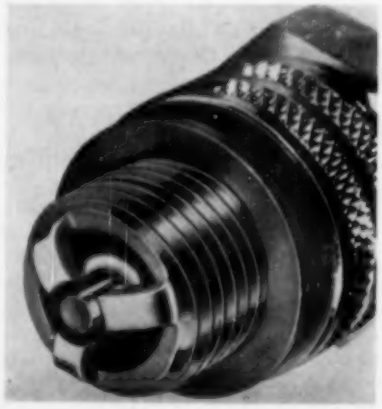
With three electrodes, the TC-3 carries its own insurance. The three gaps are factory set. If one electrode burns or erodes away beyond the most efficient gap setting, two others remain properly set to make sure of complete combustion. Plug life is doubled. Turbulence of the fuel mixture around the three electrodes and through the open gaps minimizes lead fouling and cools the nose of the plug. The exposed gap of the plug is exceptionally easy to clean.

The solid copper gasket replaces the folded copper gasket to position the spark accurately in the combustion chamber—some 1955 engine manufacturers achieve this accuracy by using no gasket at all.

The 95% plus Alumina insulator is next to a diamond in hardness. Fired at a higher temperature than other spark plug insulators, the Auburn TC-3 insulator has the highest density of any plug on the market. This is important because high density insulators resist fouling.

In field tests of the plug made by operators, fuel savings up to 40% have been noted. Acceleration and power increased 6% simply by switching to triple electrode plugs. Some TC-3 plugs installed in trucks ran for more than 40,000 miles before they were removed for examination.

The Auburn TC-3 is manufactured in sizes to fit all gasoline engines in trucks, buses, automobiles, motorcycles, tractors, construction equipment, outboard motors, power saws, etc.



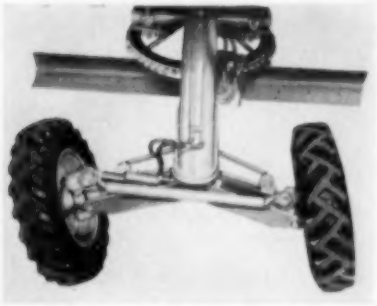
Front End Loader

Manufacturer: Mid-Western Industries, Inc., Wichita, Kan.

Claims: Although still following the same functional design that permits all-around vision without obstructions, the new Davis front end tractor loader has many new features including double-strength lift arms, down pressure on the lift rams for greater utility in excavating and maintaining grades, and rubber mounting which minimizes the shock load on the front of the tractor and shock slots that transfer the thrust to the rear. The loader also has a centralized reservoir which provides the cleanest hydraulic system available in tractor loaders.

The Model 101 series of loaders fits 2-3 plow tractors and the Model 102, with twin dump cylinders fits 3-4 plow tractors. Many attachments are available for the loader, including a Scarifier used in ripping hard surfaces.

New Grader Wheel Design



Manufacturer: Allis-Chalmers Manufacturing Co., Tractor Division, Milwaukee 1, Wis.

Claims: Allis-Chalmers announces design changes in its front wheel assembly for the Model D motor grader.

Design revisions have reduced the number of wear points on the leaning front wheel assembly and on the grader's steering mechanism. Shim adjustments are used to take up knuckle wear and bushings have been replaced by tapered and roller bearings. The greater weight of the new front axle adds to the overall weight of the Model D.

Improved control over the leaning operations has resulted from reducing the travel speed of the leaning front wheels.

STURDILITE

Heavy-Duty
FLOOD LAMPS

For Better Light • Longer Service • Lower Cost
Especially Designed for Efficient Service on
Shovels • Excavators • Drag-Lines • Roadbuilding Equipment
Locomotive Cranes • Tractors . . .

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Write for Illustrated Bulletin.

The Weight Lifting Champ

No matter what size Omaha Dragline Bucket you choose, you'll find a champion weight lifter. The surplus weight is taken out of the bucket, and it goes into the pay-load. There's extra strength for those tough digging jobs. Omahas fill quicker, dump cleaner, and stand up better. Available in four types to fit your needs. Write today for catalog giving complete description and specifications.

OMAHA
DRAGLINE BUCKETS

DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

When figuring earthmoving costs...

THE No. 12 GOES ON THE CREDIT SIDE

The Caterpillar No. 12 Motor Grader is a big, versatile machine that always is entered on the credit side of ledger books. Particularly when you figure earthmoving costs.

Knutson-Gould Construction Co. of Kansas City, Mo., knew that when it began hauling fill for the approach to the Missouri Bridge at Jefferson City. Here, you see its CAT* No. 12 Motor Grader as the cost-cutting member of a team of equipment moving 260,000 yards of loess and clay.

The No. 12 is maintaining the haul road. By so doing, it is wringing the last cent of economy out of the big tractor-scraper teams. They can haul their maximum capacity at the highest possible speed. The D7 and D8 pusher Tractors are not called away from the borrow pit to help rescue mired-down equipment.

And down time costs are slashed because the road is an *aid* to the tractor-scrapers, not a torture trail that causes breakdowns.

Your Caterpillar Dealer will be glad to show you the No. 12, No. 112 and the No. 212 Motor Graders at work on your job. Have him demonstrate the reasons successful contractors always put Cat Motor Graders on the credit side when they figure earthmoving costs.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks - ®

99% OF ALL CAT MOTOR GRADERS EVER BUILT ARE STILL IN USE

News from the Field

Dr. Eugen Diesel Visits U. S.

Dr. Eugen Diesel, son of the famous Rudolf Diesel, inventor of the oil engine that bears his name, recently visited the United States as a guest of the State Department. Dr. Diesel stopped off for a short stay in this country while enroute to his native Germany, concluding a four month tour of Diesel factories in the Far East and elsewhere in the world.

Shortly after his arrival here, the eminent German visitor attended a ceremony in Philadelphia, Pa., where he presented one of his father's original manuscripts to the Franklin Institute. A historical document in the field of power production, this manuscript is in Dr. Rudolf Diesel's handwriting and outlines his early ideas concerning the application of the Diesel engine to railroad locomotives.

Dr. Diesel feels that great strides have been made in the progress of the Diesel engine since the introduction of that prime mover to the United States at the turn of the century. The eminent visitor stated that this country had far surpassed the rest of the world in the use of Diesel power and cited as an interesting example the fact that in 1953 not one steam locomotive was ordered for use in the United States. This, he stated, definitely brings to a close the age of steam on the railroad.

While the United States has the largest Diesel engine factories in the world —the result of superior organization, machine tools, wealth, materials and working conditions—Dr. Diesel pointed out that other countries were fast improving in the production of the Diesel engine. He mentioned that Japan is now manufacturing a small Diesel engine that produces as little as one horsepower. A single factory is turning out an average of 400 of these engines per day and shipping them to undeveloped areas for farm and road building activities.

Dr. Diesel is a noted writer, scientist and publisher in Germany. Several books he has written include: *Germany and the German People*, a history of the German people; *Struggle About A Machine*, telling of the introduction of the Diesel engine to the United States; and *Diesel*, a story of the development of the Diesel engine. He also has written numerous articles for magazines.

Gordon Swardenski (left), Caterpillar Peoria plant manager, and Dr. Eugen Diesel, son of Diesel engine inventor, observe finished Diesel, ready for shipment to a job.

Ohio Pike Progress

The Ohio Turnpike Commission enters 1955 with construction of its first project—the Ohio Turnpike—approximately 65% complete and ahead of schedule according to James W. Shocknessy, Chairman of the Commission.

The highlight of 1954 was the opening to traffic of a portion of the 241-mile Ohio Turnpike—the 22-mile Eastgate Section which begins at the Ohio-Pennsylvania line in Mahoning County at the western terminus of the Pennsylvania Turnpike and runs to State Route 18 nine miles west of Youngstown where it connects with main state highways leading to Akron, Cleveland and the west. That section was opened on Dec. 1, 1954, on schedule with complete staffs of toll collectors and maintenance crews on duty and with all emergency services available.

Awarding of roadway contracts for the entire turnpike was completed July 15, 1954, when the contract for construction of the four-mile section which runs through the northern perimeter of Elyria was placed. That award brought the total cost of roadway and bridge contracts to $217,596,998.87, an

Continued on page 54

PORTABLE
CRUSHING PLANTS
UNUSED UNIVERSAL
60-80 Tons Per Hour
20 x 36 Primary. 30 x 18 Rolls. Two 80 HP gas engines. Complete with Screens, Conveyors. 84,000 lbs.
ONLY
$29,500.00
f.o.b. Los Angeles, Calif.
(Approx. 1/2 Prevailing Price)
M. N. FRANKLIN
AND COMPANY
6403 E. Slauson Ave.
LOS ANGELES, CALIF.
Phone: RAymond 3-3188

Continued from page 53

amount which was only 2.7% above the estimate of cost for such construction as contained in the Engineering Report for the Ohio Turnpike dated Aug. 15, 1951.

Before 1954 came to a close the Commission had awarded contracts for the remaining 14 toll plazas, for the remaining seven maintenance buildings, for all signs and lighting required on the turnpike, for toll equipment for automatic classification of vehicles, and for radio communication equipment. Also the Commission had received bids for contracts for the construction of 16 service buildings which will house restaurants and gasoline service stations and had advertised for bids for the construction of an operations administration building in Strongsville.

The Commission during 1954 implemented its policy of permitting no monopolies in the sale of food or fuel on the turnpike when it awarded contracts for the operation of gasoline service stations to five different oil companies and awarded contracts for the operation of restaurants to three different restaurant operators.

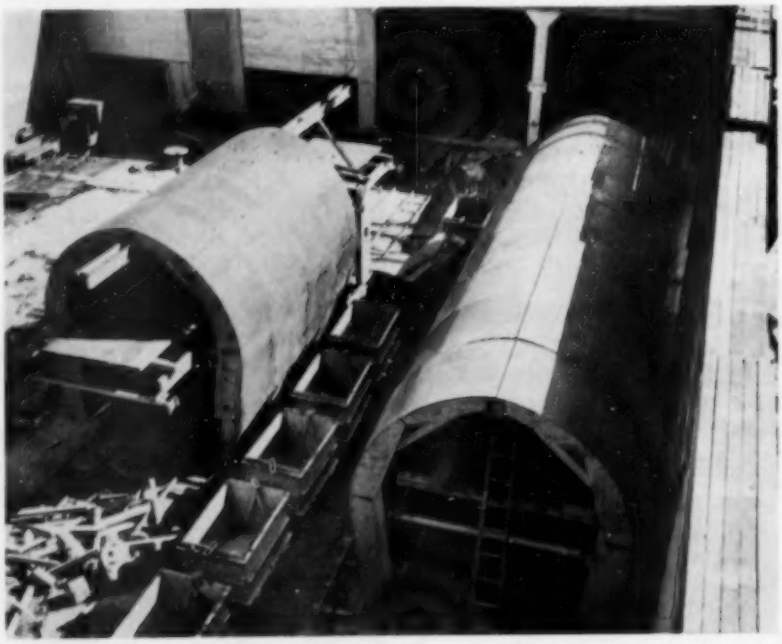
The sixteen service buildings will be built and paid for by the Commission, a development which was not contemplated when the issue of revenue bonds for construction of the turnpike was sold.

Record traffic totaling 17,098 vehicles used the 22-mile Eastgate Section of the Ohio Turnpike on Jan. 2, 1955. A record daily revenue of $5,373.30 was established on that day also.

During December, 1954, the first month of toll road operation by the Ohio Turnpike Commission, a total of 3,130,742 vehicle miles was traveled on the Eastgate Section. This mileage was rolled up by the 218,118 vehicles which used the turnpike and which accounted for a total of $86,011 in toll revenue.

Peak traffic day in December was the 26th when 14,857 vehicles went through the toll gates and produced revenue totaling $4,635.25.

During December passenger automobiles accounted for 67.24% of the vehicles which used the turnpike and for 47.15% of the tolls received. Commercial vehicles, most of them trucks, made up 32.76% of the total number of vehicles and accounted for 52.85% of the revenue.



S. A. Healy Co., Chicago, used these Blaw-Knox non-telescoping traveling forms to build extension of the Congress St. subway under downtown Windy City buildings.

Healy Uses Subway Forms

Over 200 feet of concreting has been completed on the extension of the Congress Street subway in Chicago. Non-telescopic traveling forms, designed and fabricated by Blaw-Knox Co., Pittsburgh, for the S. A. Healy Co., Chicago, are being used for both the tunnels and station.

With minor adjustment, the forms as pictured, and with an additional center crown section, will be used in the construction of the 44-ft. 8-in. wide by 18-ft. 10-in. high station section. Individually, the forms are 15 feet wide at the base by 16 feet 9½ inches high, and they are made up of 5-ft. sections.

While some big buildings were removed within the area of this subway extension, the U. S. Post Office Building remains. Some caissons supporting the building are being cut and replaced by the contractor to make way for the tunnel.

Safety Council Awards

The National Safety Council has awarded its highest honor, the N.S.C. Citation for Distinguished Service to Safety, to A. H. Zeilinger, safety superintendent at the Colorado Fuel and Iron Corporation's Pueblo, Colo., plant. The Safety Council made the award at its annual meeting held recently in Chicago, Ill.

Zeilinger has been instrumental in the achievement of CF&I's outstanding safety records throughout the years. CF&I has received numerous awards in recognition of the outstanding results obtained by the safety department and the workers of CF&I in making jobs safer all the time.

Zeilinger, who is first vice-chairman of the N.S.C. metal section, has been a member of the National Safety Council since 1939. He is also vice-president of the western region for the American Society of Safety Engineers, and a member of the Industrial Conference.

BREAKER BALLS
of Ni-Hard and Semi-Steel

EAGLE Breaker Balls available of abrasion resistant Ni-Hard nickel - chromium - iron alloy for toughest jobs and of tough semi-steel for regular jobs. Pear shaped, with easily replaced hook. In 5 sizes: 1500 lbs. to 8000 lbs. Spherical in 6 sizes: 1275 to 6350 lbs.

BULLETIN 952 describes Breaker Balls, Pile Hammers, Line Weights. Catalog 55 covers aggregate, stone and ore washers and classifiers.

Since 1872

EAGLE IRON WORKS

EAGLE IRON WORKS
264 Holcomb Ave.
Des Moines, Iowa

"Euc" Scrapers

belong in your profit picture

Struck capacities of 7, 12, 15.5 and 18 cubic yards.

Profit-making features of Euclid Scrapers pay off in high production at low cost. Owners know from experience that they get more pay yards per hour with lower operating and maintenance cost, and that means low cost per yard.

They know, too, that "Euc" Scrapers have unequalled job availability because of their simple, rugged design and easy servicing. For example, there's no down time due to cable breakage because all scraper operations are lever actuated and independent . . . and the adjustable, long-life cutting blade with four identical and reversible sections assures peak production in all types of material from sand to sticky clay.

For performance and production data on work similar to yours, have your Euclid distributor provide helpful facts and figures on "Euc" Scrapers and see the new color movie, "Equation for Profit" that shows how "Eucs" can improve the profit picture on your earth moving work.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

CABLE ADDRESS, YUKLID

EUCLID THE PIONEER

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

New Trade Literature

Subject: **Truck-Mounted Excavators**
Content: Two new bulletins describe Harnischfeger truck mounted machines. Bulletin No. TX-152 describes the Model 55 or Miti-Mite excavator. Bulletin No. TX-159 describes the company's Model 105-TC truck crane. Both are available on request.
Where to get: Harnischfeger Corp., Milwaukee 46, Wis.

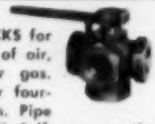
Subject: **50-R Rotary Blast Hole Drill**
Content: A 16-page bulletin describes Bucyrus-Erie's 50-R blast hole drill. Pictorially illustrated, the booklet offers a complete description of the machine's features along with a list of general specifications. The 50-R is a large-hole rotary drill, designed to put down 9⅞ to 12¼-in. diameter holes. Rotary drive machinery is powered by an electric motor and is Ward Leonard controlled, a first for rotary blast hole drills. To meet the demands of mine and quarry duty, the 50-R features a heavy duty crawler mounting, all-steel trussed frame, and quick-leveling hydraulic jacks. Other features described in easy-reading style are: power-raised derrick; remote-controlled power-driven tool handling unit; hydraulic pulldown and feed unit for air jet, tri-cone bit; air blast cleaning; water pump unit for dust elimination; and an enclosed operator's cab immediately adjacent to hole. Ask for Bulletin 50-R-2.
Where to get: Bucyrus-Erie Co., South Milwaukee, Wis.

Westinghouse Pneumatic Devices
designed to last... with minimum maintenance

CONTROLAIR® VALVES give you precise control of air pressure in extremely small increments. They are foot, hand, or cam operated. The foot and hand operated valves can be panel mounted.

NEW TYPE "D" PILOTAIR VALVES control the flow of air, oil, or water at pressures up to 250 psig. They are two-way, three-way and four-way valves operated by levers, treadles, pedals, buttons, cams, solenoids, or pneumatically. Their new seal and construction assure long life and low maintenance.

PNEUMATIC CYLINDERS used with Westinghouse Valves provide dependable linear power. Single or double-acting in diameters from 1½" to 10". Stroke length up to 42". With or without adjustable cushioning. Foot, flange, or pivot mounting.



SAVAIR® COCKS for on-off control of air, water, oil, or gas. Two, three, or four-way operation. Pipe sizes ¼" to 2". Self compensating for wear. The best cock on the market.

PLUG-IN COUPLERS. These are full-flow, heavy-duty, quick couplers available in two series: Interchange (for use with other makes) and Standard. Both are made in the Push Type, one hand connect-disconnect, and the Sleeve Type.

Consult your local Westinghouse Air Brake Distributor. He's listed in the classified phone directory under "Cylinders: Air."

Westinghouse Air Brake
COMPANY
Industrial Products Division
WILMERDING PENNSYLVANIA

Pneumatic cylinders, valves, engineered pneumatic systems and air control devices of all kinds.

Factory Branch: Emeryville, Calif. Distributors throughout the United States. Distributed in Canada by: Canadian Westinghouse Co., Ltd., Hamilton, Ontario.

Subject: **Drag Scrapers**
Content: The new bulletin No. 160 gives scraper and slackline bucket sizes for tractors from 40 to 150 hp. Maximum spans, line speeds and capacities in cubic yards are also shown.
Where to get: Sauerman Bros., Inc., Dept. E-23, 620 S. 28th Ave., Bellwood, Ill.

Subject: **Caterpillar History**
Content: Caterpillar Tractor Co. has added its story to the rapidly growing list of corporate histories in a recently released book entitled "50 Years on Tracks." This 104-page, hardbound book is one of the highlights of the "50 Years on Tracks" commemorative program which was conducted by Caterpillar during 1954 to mark the 50th anniversary of the crawler tractor. A predecessor, the Holt Manufacturing Co., is credited with introducing the world's first practical track-type tractor in 1904. The heavily-illustrated book was written and published by the company.
Where to get: Distribution of "50 Years on Tracks" is principally through Caterpillar's dealers. Copies can be purchased from them at approximately $1.25 apiece.

Subject: **High Pressure Cleaner**
Contents: Malsbary's new, improved Model 250 High Pressure Combination Cleaner is fully described in a new eight-page catalog. This catalog recommends uses, briefly describes the five different cleaning actions of the Model 250 and such exclusive patented features as the pumping system, and reverse blowdown for keeping

coils free of scale. It shows the Malsbary full-swivel steam gun and heavy-duty diaphragm pump; tells how the new Model 250 provides greater volume (360 gph), greater pressure (to 300 psi) and higher temperatures (to 325° F.). It also contains a cost comparison chart, an easy-to-follow operating chart, and condensed specifications. Write for Catalog No. 250.

Where to get: Malsbary Manufacturing Co., 845 92nd Ave., Oakland 3, Calif.

Subject: **Safety Saves Dollars**

Content: A handy booklet for cost-conscious construction contractors has been published by the National Safety Council and is entitled *100 Ways to Save a Buck*. The booklet is an illustrated reprint of a talk by John A. Volpe, president and treasurer, Volpe Construction Co., Malden, Mass., before the Council's Construction Section at the 39th National Safety Congress. Volpe outlines the accident prevention program of his company and shows the many ways in which safety pays off in dollars saved. He includes a brief 10-point construction safety program for contractors. The 32-page booklet is printed in two colors and contains many photographs illustrating the way in which accident prevention can be promoted on a construction job. Single copies of *100 Ways to Save a Buck* are available on request.

Where to get: National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Subject: **Le Roi 85 cfm Airmaster**

Content: Four-page bulletin describes Le Roi 85 cfm Airmaster. A cross section view of the one unit engine-compressor design, shows how the single cooling system, one lubrication system, and one crankcase and crankshaft simplify manitenance. Magneto ignition, replaceable wet type cylinder sleeves, tight sealing sides for tool and hose storage, and water cooled manifold are other time and money saving design points which are brought out. Specifications are given for the compressor and engine. Tool capacities are included as well as weights and dimensions for skid and wheel mounted units. Free.

Where to get: Sales Promotion Department, Le Roi Division Westinghouse Air Brake Co., 1706 S. 68th St., Milwaukee 14, Wis.

Subject: **Koehring 20-Ton Lift Crane**

Content: An 8-page catalog describes the Model 405. Crawler mounted, the 405 can be equipped with a full complement of attachments. This includes one cubic yard shovel and hoe dipper and the 20 ton capacity lift crane boom. Size of clamshell and dragline buckets used in connection with this boom varies with the weight of the material to be lifted. Digging depth of the hoe is 22½ feet. The 405 can be lightened for road travel because crawlers and counterweights are easily removed. A fine selection of machine part photographs is used in the catalog. Free.

Where to get: Koehring Co., Milwaukee 16, Wis.

Subject: **Safety Supplies**

Content: Catalog gives complete information on all Bullard safety products in a quick and efficient manner. On all pages clear photographs of the items being explained are shown along with easy-to-read technical data.

Where to get: E. D. Bullard Co., 275 Eighth St., Dept. 531, San Francisco 3, Calif.

Always insist on genuine

BLAW-KNOX REPAIR PARTS

• cut clamshell maintenance costs

• reduce costly downtime

• prolong bucket life

BLAW-KNOX repair parts are especially designed to fit your Blaw-Knox Clamshell. They contain *all* the carefully engineered features of the original parts to assure the efficient operation, low maintenance and long life you expect from Blaw-Knox products.

There's no need to use a costly "mongrel" bucket . . .

always insist on genuine, factory-built repair parts.

Write for a parts book today, if you don't have one, giving the serial number of your bucket.

Get this "Bucket Saver" booklet

It's the only booklet available with a bucket-saver list of "do's" and dont's on clamshell use and abuse. It illustrates reeving methods that improve bucket performance. It gives complete details on bucket repair. It contains 40 pages of usable information. Write for Bulletin 2373 today!

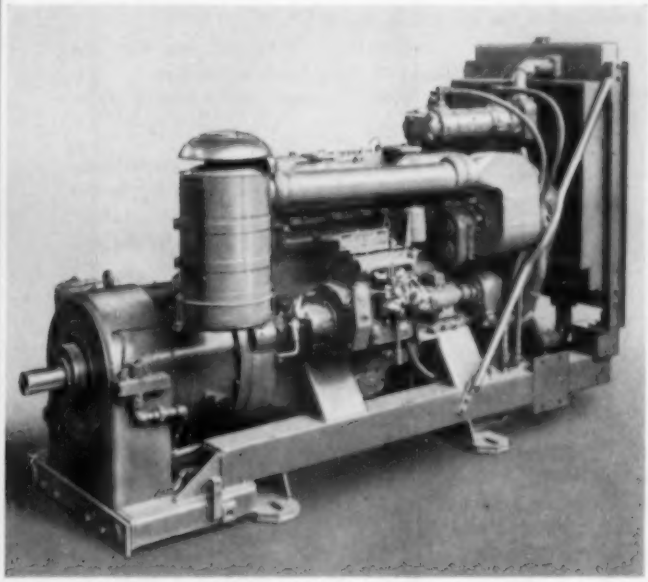
BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
PITTSBURGH 38, PA.
Offices in Principal Cities
DEPARTMENT 741

PHONE . . WIRE . . WRITE . . YOUR BLAW-KNOX DISTRIBUTOR

Bucyrus-Erie 88-B Shovel Design Increases Digging Power, Digging Speed, And Digging Life

For sustained high output in heavy-duty service, here's an excavator that will meet your demands fully — the Bucyrus-Erie 4-cu. yd. 88-B. Three main features contribute to the 88-B's high production performance: torque converter drive for the heavy-duty diesel engine; a new outstanding positive twin rope balanced crowd system; and full air control over all operating functions. See the opposite page for what these features can mean to you. Then, get the complete 88-B story from your nearest distributor.

94E55C



THERE'S LONGER DIGGING LIFE—

Diesel engine power with torque converter drive means smoother starting of heavy loads, less shifting and braking. Oil cushion not only saves on engine wear, but protects brakes, clutches and transmission from jarring impacts of digging.

THERE'S MORE DIGGING SPEED—

Full air control, not just air assist, for all machine functions — operating clutches, brakes, dipper trip — except manually controlled engine governor, provides a high degree of "feel", makes operation fast and accurate.

THERE'S MORE DIGGING POWER—

New 88-B positive twin rope balanced crowd system automatically helps operator to properly proportion speeds and forces between hoist and crowd . . . provides greater digging force.

BUCYRUS ERIE

South Milwaukee, Wisconsin

To meet *your* job conditions, you can take your choice of three crawler mountings — standard with flat ends, long with tapered ends, or long with flat ends. Four A-frames are offered: standard high and low frames, and power-controlled high and low frames. Front-end equipment for crane, clamshell, dragline and stripping shovel operations is available. Power boom hoist is standard equipment; an independent friction-type boom hoist is also available at extra cost.

NOT in the Contract

Wife: "Now, Jim, don't scold because I was too tired to sew a button on your trousers. I hope you don't think your old pants are more important than your wife?"

Contractor: "Well, there's lots of places a man can go without his wife."

"How do porcupines make love?"
"Very carefully."

Automobile Salesman: "Eventually all your driving controls will be grouped together on the steering column."

Contractor, skeptically: "Do you think she'll fit?"

Walking up to the ticket window at the rocket station, the man asked for a seat to the moon.

"Sorry, sir," said the attendant, "but all passenger flights have been cancelled for a couple of days."

"Oh? Why is that?"

"Well, the moon is full right now."

Standing in a crowded street car, a rather buxom woman was vainly trying to find a token for carfare. All her pockets had been tightly buttoned as a precaution against pickpockets, and no little commotion resulted.

"Please let me pay your fare," said the man beside her.

"Nothing of the kind," she replied, continuing the search. "I've got the fare here some place."

"I'm sure of it lady," said the man, "but I'd like to pay your fare. You've unbuttoned my suspenders three times already."

They say that asking a woman her age is like buying a second-hand car. You know the speedometer's been set back—but you never know how far.

"Is **that** the expert crane operator you were telling me about?"

Wife: "Hello, Cookie? I'm sure glad you're home."

Operator: "Why do you call me Cookie? You never did before."

Wife: "Because you've been a wafer so long."

A young bride of three months complained to her relatives about her operator husband's continued drinking habits.

"If you knew he drank, why did you marry him?" she was asked.

"I didn't know he drank," the girl replied, "until one night he came home sober."

Contractor: "You'll have to see our junior partner—he's down in the park sitting in a tree."

Customer: "What's he doing in a tree?"

Contractor: "Running our branch office."

Into a doctor's office in a hamlet of the hillbilly country, an old mountaineer carried a young fellow and carefully placed him on the examination table.

"Doc," asked the old fellow, "can you fix up mah son-in-law? I shot him in the leg."

"Why did you want to shoot your kin?" the doctor queried.

"Wall, Doc, he warn't mah son-in-law when ah shot him."

French lawyer, pleading for an attractive transgressor:

Gentlemen of the jury, shall this charming young lady be cast into a lonely cell, or shall she return to her beautiful little apartment at 33 Rue Neuve, Telephone 88-39-54?"

Meeting at a social gathering, a lawyer called a physician friend aside and said, "I hate to come to these things. People are always asking for free advice. Do you have to put up with that too?"

"Why, yes, people are always approaching me for free medical advice," said the doctor. "But I interrupt them with a curt arbitrary command—'Disrobe.' After that, I really have no trouble."

One night the pullman conductor found a red lantern hanging on one of the lower berths, so he looked up George, the porter, and asked, "Say, George, why is that red lantern hanging on lower six?"

"Well, boss, rule 23 in my instruction book says that you should always hang up a red lantern when the rear end of the sleeper is exposed."

Down time gives anyone the freezin' fidgets. Best way to avoid it is to insist on genuine CAT* parts every time. That's the only way to be sure of getting parts that are made to the latest design, precisely manufactured of the right materials, rigidly inspected and tested.

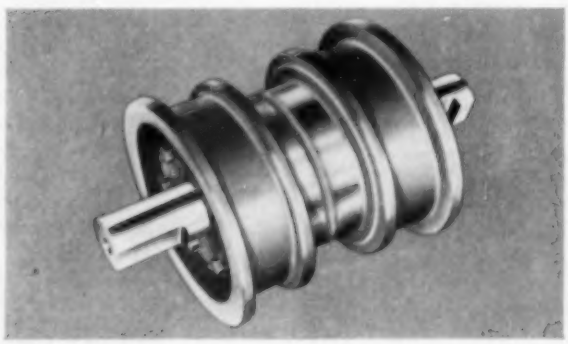
Take track rollers, for example

Some makes of track rollers may look alike—at first glance. But look closely at a genuine Cat roller: deep-hardened forged steel rims, center welded to prevent spreading... one-piece shaft... cast iron hub of high compressive strength to lessen bore distortion... specially alloyed bronze bearings... shaft wearing surfaces "Hi-Electro" hardened. With a substitute roller: who can be sure?

The difference on the job: with genuine Caterpillar-built track rollers you get extra trouble-free hours of profitable production, and top performance in even the worst working conditions.

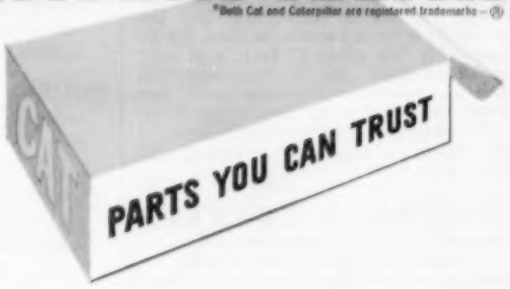
With substitute parts: who can be sure? **Better get genuine Caterpillar parts every time.**

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.



CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—(R)



Notes from the Manufacturers

Westinghouse Air Brake Co., Pittsburgh, Pa., has appointed Charles J. Haring as director of equipment sales. Haring, who joined the company's executive staff at Gateway Center, Pittsburgh, immediately, has been general sales manager of J. D. Adams Manufacturing Co., Indianapolis, Ind. Haring had been with Adams since his graduation from Purdue University in 1929. He has also been the company's export manager, Washington office manager, and eastern sales manager. In Washington, he served as director of the construction machinery division of the Commerce Department's National Production Authority.

Euclid Division General Motors Corporation, Cleveland 17, O., has appointed Euclid-Tennessee, Inc., Nashville, dealer for the complete line of Euclid earth moving equipment in Middle Tennessee. This new corporation is another step in the expansion program of the R. A. Trippeer organization that is designed to provide still better service to contractors, mines and quarries using heavy equipment. Other companies in the group are Euclid-Memphis Sales, Inc., Euclid Sales & Service, Inc. of St. Louis, Euclid-Kentucky, Inc., Louisville, and Euclid-Arkansas, Inc. at Little Rock. James R. Elrod is general manager of Euclid-Tennessee; John Johnston is service manager and the parts manager is Henry Grisson. In addition to Euclid scrapers, rear-dump and bottom-dump hauling units, and loaders, the new dealership will handle Bucyrus-Erie, Cedar Rapids and Chicago Pneumatic equipment. General Motors Diesels will also be sold and serviced.

In a Hayward, there's no contact between the closing mechanism and the gravel or other materials handled. To be sure—this "no contact" feature is only one advantage. But a very important one to you—since it means much less wear, reduced upkeep, and a significant dollar-saving in bucket maintenance.

The Hayward Company, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

Timken Roller Bearing Co., Canton 6, O., appointed D. G. Gibson as District Manager of the company's Dallas territory, suceeding the late Harry Trump to that position. Formerly Assistant District Manager, Gibson first came to The Timken Roller Bearing Co. after graduating from Penn State University in mechanical engineering in 1938. He was assigned first to the Timken Company's Boston office in 1941. After serving in the United States Navy from September 1942 until December 1945, Gibson was re-assigned to the Cincinnati office. In May of 1949 Gibson was appointed Assistant District Manager in the Dallas office. The company also announced that Frank G. Siler has completed the company's industrial sales training program and has been assigned to the Moline office as a field engineer.

International Harvester Co., Chicago, Ill., has appointed Howell Tractor and Equipment Co., 7443 S. Racine Ave., Chicago, Ill., as northern Illinois and northwestern Indiana distributors for its industrial power products. Howell will represent International industrial power products in 17 counties in northern Illinois and in Lake, Porter, and LaPorte counties of Indiana. The firm is headed by Tom LaVorene, president, and Dave Howell, vice president, Don Boyle is service manager, and Carmen Napoli is parts manager.

Heil Co., Milwaukee, Wis., has announced that General Truck Equipment Co., 2699 Atlantic Ave., Long Beach, Calif., is now the southern Los Angeles County distributor of Heil dump bodies and hydraulic hoists, and Heiloader hydraulic elevating tailgates. Its sales territory includes these towns and communities in southern Los Angeles County: Long Beach, Signal Hill, Seal Beach, Artesia, Bellflower, Clearwater, Hynes, Compton, Gardena, Torrance, Wilmington, and San Pedro.

Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich., has appointed Charles H. Stewart factory sales representative to serve GM Diesel distributors in the Dakotas, Minnesota, Nebraska, Iowa, Kansas, and the western half of Missouri. He succeeds William R. Bays who is now the GM Diesel distributor at Wichita, Kan. Stewart was formerly service representative for Detroit Diesel in a Texas zone and has been with the Division since 1946. His experience with General Motors Diesel engines dates from World War II during which he served as instructor of Diesel servicing and maintenance in the Army Ordnance Department. He assumed his new duties in January. C. F. Davy, who served the Division as sales representative in this area temporarily, returns to his former post in a southeastern sales zone.

Marion Power Shovel Co., Marion, O., announces establishment of a consolidated sales and service department, effective the 1st of January, for the entire line of Marion-Osgood-General equipment in both the domestic and export markets. D. E. Rizor has been named to head the coordinated program as vice president for sales and service. Kenneth E. Williamson, Marion-Osgood-General sales manager, small machines, is concentrating his activities in the sale of equipment in sizes of four cubic yards and under. Richard M. Bessom is export sales manager. Coordination of sales and service of the entire line of Marion-Osgood-General excavating equipment, power shovels and cranes is designed to provide greater convenience to customers. Prior to the consolidation, separate sales and service operations had been maintained by Marion Power Shovel Co. and The Osgood Co. which Marion acquired early in 1954. Mr. Rizor's long association with Marion extends back to 1925 when he joined the company as a shop clerk. He was in charge of the company's Chicago office for 13 years and in charge of the New York office for two years. His election to

Continued on page 64

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Marion 7200 diesel walking dragline; new 1948, 135' boom and 5 cu. yd. bucket; working at Coalgate, Oklahoma, available now. Contact Henry L. May c/o C. Y. Semple, P. O. Box 390, Baxter Springs, Kans. phone: 44 Picher, Okla.

3-W electric walking dragline serial #443, 80' boom, 3 cu. yd. bucket, single motor 150 H.P., 3 phase, 60 cycle, 4000 volts; some spare parts included; reasonable price.

1½-T electric walking dragline serial #414, 60' boom, 2½ cu. yd. bucket, single motor 100 H.P., 3 phase, 60 cycle, 4000 volts. These machines located in Florida and offered at reasonable prices. Box 3590

PCA-5308 Brownhoist locomotive crane, shop #9518 with boom but without bucket or spare parts; price: $5000.

PCA-5524 Bucyrus-Erie dragline, model 801, class 24, with boom and such spare parts and accessories as may be on hand, but without bucket; price: make offer.
Pacific Coast Aggregates, Inc., 400 Alabama St., San Francisco 10, Calif.

Bucyrus-Erie model 120-B electric shovel, excellent mechanical condition, new in 1949, located in Minnesota, priced to sell. Box 3566

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Lima model 34 size ¾ cu. yd. Paymaster clamshell machine, serial #896, 35' crane boom, Buda gasoline engine, electric starter, no bucket, reconditioned, excellent buy.

Loader: New Trojan model LC-100-B demonstrated several times; gas engine, torque convertor, 1 yd. bucket; excellent bargain.

Crane and Backhoe: Used Osgood Invader ½ yd. powered by gasoline engine; 40' crane boom; Rudomatic tagline and dragline fairleads. Stuart M. Christhilf & Co., Inc., 134 W. Mt. Royal Ave., Baltimore 1, Md.

15-B shovel, serial number 86726 with Caterpillar D315 diesel engine, $8500. Charles Brake, St. Thomas, Pennsylvania.

We will swap Michigan C-16 dragline ½ yd., 45' boom, new G.M. diesel and cab and Northwest 25 dragline, serial #12328, ¾ yd., 45' boom for two 2½ yd. used draglines. L. C. Dragline Co., Buras, Louisiana.

If you are Buying or Selling Used Equipment this is the place to let the Excavating Industry know about it.

RS-2619 (B) Bucyrus-Erie mdl. 10-B ⅜ cu. yd. dragshovel, shovel and lifting crane combination on crawlers, electric starting, enclosed cab; powered by Buda mdl. 6-B 230 6 cylinder gasoline engine.
Sale Price F.O.B. Louisville, Ky. $6000

S-461 (B) Lorain mdl. TL-20 ½ cu. yd. capacity backhoe on crawlers, fully enclosed cab, angle iron grousers with extra counterweights, powered by Caterpillar mdl. 315 diesel engine.
Sale Price F.O.B. Evansville, Ind. $5500

S-555 (C) Insley mdl. K-12 ½ cu. yd. crane with 45 ft. boom, equipped for clamshell operations; powered by Chrysler gas engine; electrically started and mounted on crawler tracks 18" wide; engine completely rebuilt.
Sale Price F.O.B. Evansville, Ind. $5500

RS-2537 (A) Bucyrus-Erie mdl. 15-B ¼ cu. yd. clamshell excavator on crawlers, fully enclosed cab with 30' boom and counterweights; powered by International UD-350 diesel engine.
Sale Price F.O.B. Louisville, Ky. $14,900

RS-2538 (A) Bucyrus-Erie mdl. 15-B ½ cu. yd. combination clamshell, excavator and lifting crane w/extra counterweight; fully enclosed steel cab, crawler mounted; powered by International UD-350 diesel engine, complete with electric starting; used 90 days.
Sale Price F.O.B. Louisville, Ky. $15,100

S-560 (B) Buckeye mdl. 70 excavator w/35' boom and fairleads, ¾ yd. P.M. drag bucket; ¾ yd. shovel front and powered by GM #371 diesel engine w/torque converter.
Sale Price F.O.B. Evansville, Ind. $6,500

S-444 (C) P&H mdl. 255-A ¾ cu. yd. shovel on crawlers, fully enclosed cab, electric starting, powered by Waukesha mdl. MZA gasoline engine.
Sale Price F.O.B. Evansville, Ind. $6,950

RS-2338 (C) Lima mdl. 34 Paymaster ¾ cu. yd. drag shovel on crawlers, enclosed cab, electric starting, wide pipe line mounting; powered by GMC mdl. 4-71 diesel engine.
Sale Price F.O.B. Louisville, Ky. $7,900

S-905 (B) Lima mdl. 101 1½ cu. yd. dragline on crawlers with 70' cross welded boom and 1½ cu. yd. bucket and fairleads; powered by Waukesha gasoline engine.
Sale Price F.O.B. Madison, Ind. $6,500

S-904 (B) Lorain mdl. 82 dragline w/2 cu. yd. Esco Rock bucket; powered by Waukesha 6WAKH gasoline engine w/electric starting and hydraulic coupling; fully enclosed steel cab; good condition throughout; serial No. 10623, engine serial No. 485524.
Sale Price F.O.B. Louisville, Ky. $21,500

S-491 (B) Shovel front complete with ½ cu. yd. dipper for Lorain TL-20.
Sale Price F.O.B. Evansville, Ind. $1,200

S-2311 (B) Shovel front attachment for mdl. "E" "Quick-Way," complete w/ 4/10 cu. yd. dipper; has been used very little.
Sale Price F.O.B. Louisville, Ky. $1,000
Box 3580

Model H-3 hydrocrane including ½ yd. clamshell bucket, tagline reel and equipped with standard hoist rams; this machine is mounted on an International KB6 truck; both crane and truck maintained in perfect mechanical condition and is perfect in appearance; for sale at approximately one-half new price. Nesbitt Equipment Co., 446 Calvert Avenue, Alexandria, Virginia and P. O. Box 819.

For sale or will rent at A.G.C. rental rates Bucyrus-Erie 54-B dragline, long and wide caterpillars, maximum 80' boom, Buda 1879 diesel engine, serial #50753; machine in excellent condition. Carveth Construction Co., Lincoln, Nebraska.

Lima 1201 combination shovel and dragline. Cummins diesel engine, 80' dragline boom. Location middle west; priced to sell. Box 3548

MISCELLANEOUS EQUIPMENT

Model 250 Parsons trencher, maximum cutting depth 15 ft., used only two weeks; attractive discount. Associated Engineers, Inc., 11 N. Main St., Fond du Lac, Wis.

New 18" dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 vane runner; spare liners.
Box 3587

One set of 120-B dragline equipment complete with 93' boom, mast and 4½ yd. dragline bucket. Box 3597

Complete dragline equipment including 90 foot boom less bucket removed from Bucyrus-Erie 100-B, serial #23067, price: $5000. Morrison-Knudsen Company, Boise, Idaho.

Osgood 200 shovel front, complete, excellent condition; F.O.B. our yard; $750. Kirkpatrick Const. Corp., P. O. Box 380, Hopkinsville, Ky. Phone: Tuxedo 6-1100.

Model 10-B Bucyrus-Erie shovel; model "L" Quick-Way 30' crane (new); model 375-BC American ¾ yd. shovel and 55' boom, diesel engine (1952); model TL-20 Lorain Moto crane, 30' boom, mounted on Moto Carrier; model 22-B Bucyrus-Erie clamshell GM diesel, also shovel attachment; model 200 Osgood ½ yd. crane; model 200 Osgood ½ yd. backhoe; three model LD-5 Scoopmobiles; 20 Ingersoll-Rand compressors, 600, 315, 210, wagon drills, breakers, etc.; 9B3 McKiernan Terry Hammer; 50' set pile leads for McKiernan Terry Hammer; five model K5 Nelson bucket loaders, pneumatic tired; Meili-Blumberg model 44 gas powered grader (demonstrator); Barber Greene bucket loader on crawler; two model D7 Caterpillar tractors with LeTourneau PCU and tilt blade; model TD-18 International tractor, diesel, B.E. hydraulic bulldozer; D4 Caterpillar tractor with ¾ cu. yd. Traxcavator; Rex model 160 single pumperete; Rex model 200 single pumperete; Rex double pumperete, model 200; Bay City ¾ yd. shovel with Caterpillar diesel engine; model 15-B Bucyrus-Erie ½ yd. backhoe, gasoline powered, clamshell buckets: ⅜, ½, ⅝, ¾ and 1 yard. Furnival Machinery Co., Lancaster Ave. at 54th St., Philadelphia 31, Pa.

Locomotives, 10 to 100 ton, std. & 36" gauge.
Cranes, draglines, shovels, 1½ to 23 yds.
Rock, ore crushers, jaw gyratory; large.
Whirley gantry cranes, 30-60 tons cap., elec.
Rotary dryers, kilns, 8x125, 7x125, 7x110.
B-Monighan walking draglines, 2 to 12 yds.
Diesel-elec. generator sets, 320 to 1000 KW.
Yuba electric 6' gold placer dredge.
Bucyrus 20" hydraulic dredge, 115' cut, elec.
Page 10-yd. diesel walking drgl., 140' bm.
McMyler elec. 20' gauge crane, 30-ton, 87' bm.
Marine diesel engines. Derrick boat. Tugs.
H. Y. Smith Company
828 North Broadway Milwaukee 2, Wis.

MISCELLANEOUS EQUIPMENT

Atco model RHTD-14W new angle dozer ready for installation complete with front PVT for I.H. TD-14 bowl 10' – 8½" wide, located Pennsylvania, sale price: $1975.
Box 3600

Six cubic yard dipper and Tri-Ten handle for Bucyrus-Erie 150-B Shovel; slightly used but in excellent condition. Box 3588

EQUIPMENT WANTED

Wanted: Good used crushing and washing gravel plant, 100 to 300 ton per hour.

Wanted: Crane boom for one yard Osgood Conqueror, serial No. 2282. Rupp Construction Co., Marshallville, Ohio.

POSITION WANTED

Superintendent available. 20 years experience and qualifications covering hi-ways, airports, large sewers, water lines, heavy and light excavating; all types; know cost and modern equipment; sober, honest, and reliable. Box 3593

HELP WANTED

Qualified superintendent wanted with proven executive ability for large Mid-Eastern aggregate producer; write giving full experience, references, age and salary.
Box 3592

Wanted: County road commissioner. The County of Mono, State of California invites applications for this position; applicants must be registered California Civil Engineers with experience in administration, engineering, road construction and maintenance; salary $550 per month for a six month probationary period; at end of probationary period, salary increases depending upon qualifications. For information, write or call Howard Emrich, Acting Road Commissioner, Bridgeport, California.

SERVICES OFFERED

CABLE TOOL DRILLING CONSULTING SERVICES

Bit dressing and hardening a specialty. The only private consulting service in the churn drilling field.

For information write:
R. C. (Bob) Woodward
(Formerly Chief Metallurgist Bucyrus-Erie Company)
3480 North Murray Avenue
Milwaukee 11, Wisconsin

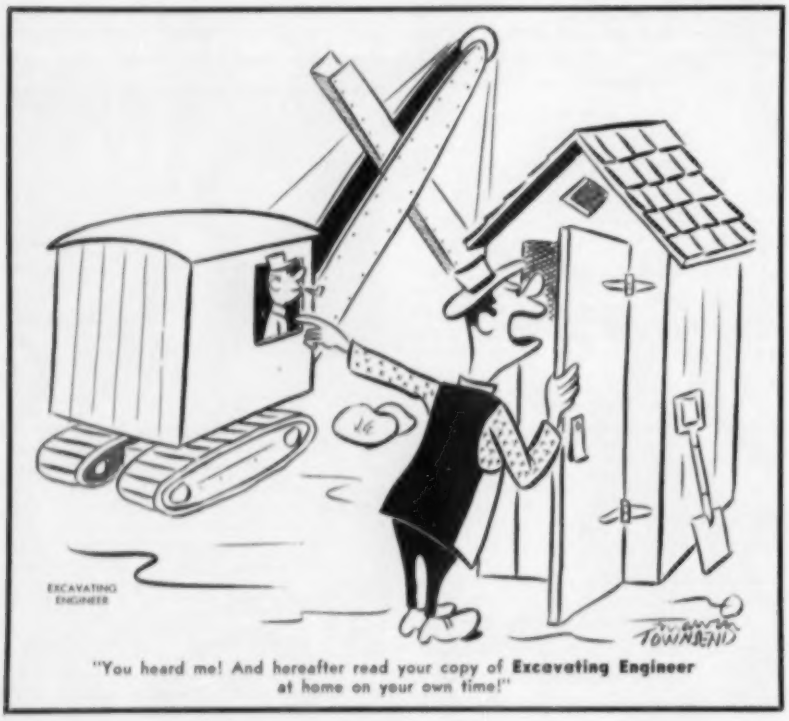
Notes . . .

Continued from page 62

vice president last April was preceded by two years of service as assistant to the president.

Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore., named Harvey A. Raasch as Export Sales Manager. Raasch joins Hyster with more than 15 years' experience in the export sales field. He was previously assistant export manager of the Le Roi Co., Milwaukee, Wis., and prior to that associated with the Tractor Export Division of Allis-Chalmers Mfg. Co. In his new position Raasch will direct overseas marketing for the Hyster lines of industrial lift trucks and logging and construction equipment sold by over 400 Caterpillar-Hyster export dealer outlets. Export division offices of Hyster are located in Peoria, Ill., where Raasch will headquarter.

Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Lima, O., announces the appointments of R. C. Larkin Co., Chicago, Ill., and Industrial Tractor & Equipment Co., Inc., Nashville, Tenn., as distributors. The Larkin Co., covering Northern and Central Illinois, will handle the complete line of Baldwin-Lima-Hamilton construction equipment — Lima power shovels, cranes, draglines, pull shovels and Austin-Western power graders, rock crushers, rollers, scrapers, hydraulic cranes and Badger shovels. Industrial Tractor will handle the Lima line of power shovels, cranes, draglines and pull shovels in Central Tennessee. The manufacturer has also appointed Kentucky Equipment Co., Inc., 3611 St. Germaine Court, Louisville, Ky., as distributor for Lima shovels, cranes, draglines and pull shovels. The distributorship covers the entire State of Kentucky with the exception of the three extreme northern counties and three southeastern counties.

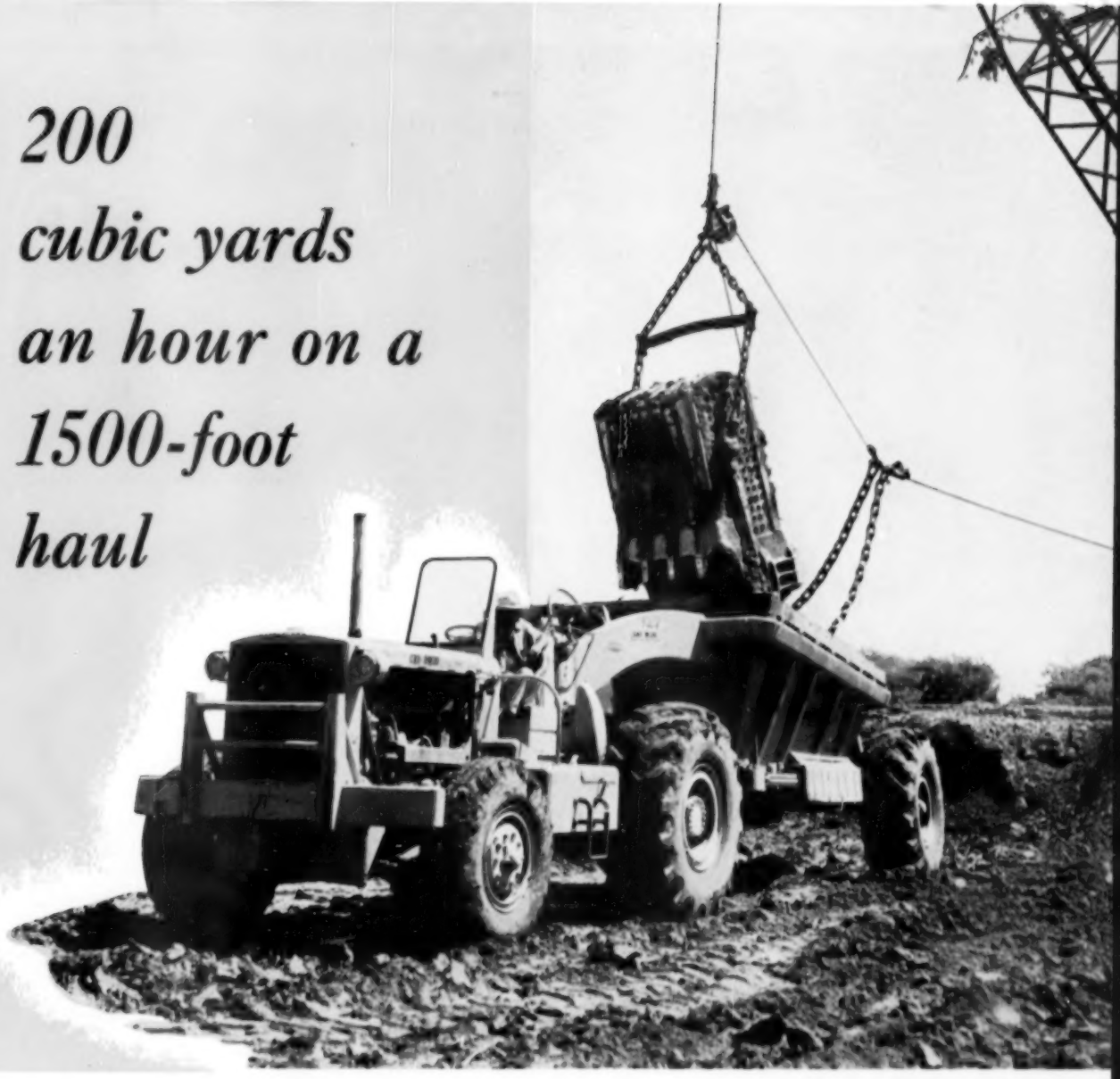


"You heard me! And hereafter read your copy of **Excavating Engineer** at home on your own time!"

Le Roi Division, Westinghouse Air Brake Co., Milwaukee 14, Wis., appointed Paul D. Sullivan as assistant sales manager. Sullivan will headquarter in Milwaukee moving from New York where he has been in charge of contractor sales since joining the Le Roi Division of Westinghouse Air Brake Co. more than a year ago. He will be concerned primarily with promoting the sale of Le Roi portable air compressors and Westinghouse stationary air compressors, both manufactured by Le Roi Division in Milwaukee. After graduation from Mt. Angel College in Oregon, he worked as a civil engineer for 14 years. Sullivan joined Clyde Equipment Co. in Oregon in 1936.

Clark Equipment Co., Benton Harbor, Mich., appointed Russell L. McKinley as field service manager of the Construction Machinery Division. McKinley was formerly service manager for Browning Crane & Shovel Co., Cleveland.

200 cubic yards an hour on a 1500-foot haul



Cat® DW20 Tractors and W20 Wagons are key units in the earthmoving spread of Geo. Bennett Construction Co., Kansas City, Kansas.

Loaded by the dragline, one of these machines handles 18 cubic yards of material and makes 11 to 12 quarter-mile round trips to the fill per hour. On a construction job near Turner, Kansas, three DW20-W20 units moved 25,584 yards of earth in five working days.

The Bennett Co. also has Caterpillar DW21s, D8s, D7s and Scrapers in its big yellow fleet. Mr. Bennett says: "I have been using Cat machines since 1920. They've been tough and rugged and have held up better than any competitive product I know of."

The fast-moving DW20 Tractor, with its 225-HP Caterpillar Engine, furnishes perfectly matched power for the W20 Wagon. The wagon itself is built to outperform and outlast any other hauling unit in its class. It's engineered for the job, with weight evenly distributed between tractor and wagon tires. Hydraulic ram dumping gives the operator accurate control. And the generous size of the hopper offers a good target for the shovel.

Get actual production figures from your Caterpillar Dealer, nearby for information and service. He'll demonstrate right on your job, where you can compare cycle times with other equipment. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

How COOPER-BESSEMER Power digs out Al_2O_3. $2SiO_2$. $2H_2O$... and piles up economy

This heavy-duty Cooper-Bessemer powered Bucyrus-Erie walking dragline, owned by Southern Clays, Inc., is used to strip overburden in the clay area running northeast from Macon, Georgia.

Al_2O_3. $2SiO_2$. $2H_2O$ . . . chemical symbol for kaolin . . . is a special kind of clay required by the paper, ceramic and rubber industries.

In Georgia, where 80% of the nation's kaolin supply is found, a 550 hp Cooper-Bessemer diesel supplies digging as well as walking power for this big Bucyrus-Erie 7-W dragline used to strip overburden from kaolin.

Stripping to a depth of 100 feet takes a lot of "drag," and an equal amount of Diesel stamina and flexibility. It means hour after hour of no-load-too-full load operation at nearly constant governor-controlled speed.

With Cooper-Bessemer Diesel power, there's not only top availability, but instant response and smooth operation at any load . . . on the most rugged of dragline jobs. It adds up to maximum production at minimum cost.

If your plans call for powering or repowering — mobile, stationary, marine — contact our nearest office for complete facts on Cooper-Bessemer advanced, money-saving features.

MOUNT VERNON, OHIO

COOPER-BESSEMER

GROVE CITY, PENNA.

New York City • Seattle, Wash. • Bradford, Pa. • Chicago, Ill. Houston, Dallas, Greggton, Pampa and Odessa, Texas Washington, D. C. • Shreveport, La. • San Francisco, Los Angeles, Calif. • St. Louis, Mo. • Gloucester, Mass. • New Orleans, La. • Tulsa, Okla. • Cooper-Bessemer of Canada Ltd., Edmonton, Alberta—Halifax, Nova Scotia.

DIESELS • GAS ENGINES • GAS-DIESELS • ENGINE-DRIVEN AND MOTOR-DRIVEN COMPRESSORS